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JOURNAL *of* EDUCATIONAL RESEARCH

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STANDARDS IN EDUCATION

B. R. BUCKINGHAM
Ohio State University

Perhaps it is because of the industrial application of the idea of standardization that many sterling school people have been unable to approach with an open mind the question of standardization in education. They are quite sure that they do not want standards set up in their schools. They have their minds upon standards in industry—standards whereby a number of operations are reduced to a few processes; standards whereby products are made to exact dimensions. Perhaps when they think of standards they call to mind motion studies in the manual trades and, in the factory, jigs and dies and interchangeable parts. No doubt they are ready enough to admire the accuracy with which machine parts may be turned out accurate to a thousandth of an inch. Very likely in 1917 and 1918 they applauded the government's ship-building enterprise when the fabricated vessel was evolved, and when quantity production was assured through having standardized plates made inland and delivered to the shipyards to be assembled. Doubtless they approve of these things, and they can even become enthusiastic about them; but the standardizing of children, they say, the moulding (moulding is the word, is it not?) of pupils in conformity with a pattern—this seems to them to be monstrous.

At the outset, therefore, I should like to say that I am as vigorously opposed as these people are to the effort to cast children in the same mould, either physically, intellectually, or morally. The school is not a factory; and from it children are not to be turned out, each the same as the other, like buttons from a mill.

The fact is, however, that since the standardization movement in the sense in which we usually recognize it began to develop in school work some twelve or fourteen years ago, greater respect for individuality, greater deference to initiative, and greater appreciation of personality, has been shown than was ever shown before in the history of education. It is not without significance that the intelligent training of physically and mentally handicapped children has been carried to its present development precisely during the period of the measurement movement. The identification of the gifted child, even under untoward circumstances, the appreciation of him, and the moral conviction of the injustice we have done him has come about in the same period. This salvage of priceless human material by modern measurement procedures is in itself one of the most attractive as it is one of the most hopeful of the many by-products of standardization.

Indeed, the discovery and development of unusual talent is the greatest conservation movement in which the nation can be engaged. It is greater than the conservation of forests, of coal, or of oil; for all of these are important only as they minister to man; and man is distinguished from the brute creation precisely in the matter of his mentality. Otherwise he is a weakling. He is neither very strong nor very swift. He does not hear very well and his sense of smell is atrophied. If you are concerned with the maintenance and growth of our national possessions you cannot be indifferent to the greatest of them all, the resources of intelligence. The value of coal and water power and seal fisheries are indeed expressed in dollars; but no value is put upon intelligence for it is priceless. There is nothing more fundamental in the way of national resources than the sum total of available intelligence.

The point I am trying to make is that education as adjustment—and it was so defined long before standardization became a shibboleth—demands something to which to adjust. You cannot get along without norms of some kind. To do so is to work without chart, compass, or guiding star. In reality we do no

such thing. We have standards—we all have them. Without them we should be merely on our way without knowing where we were going. The issue is not between standards and no standards; but rather between good standards and bad standards or between definite standards and indefinite standards.

And if we adopt another definition of education and say, as many do, that it is change, then we are still dependent upon standards to tell us in what direction we are to cause change to take place, how far we are to carry it, and especially which of all the thousands of changes that might be made, ought to be made and in what order.

Now, if I say that standardization, instead of making children alike, really takes account of their differences, I should be able to give a reason for my statement. I think I can do so. It seems to me to be clear that you cannot make any kind of adaptation of instruction to those who are below or above standard until you know what the standard is. And you can succeed vastly better in your adaptation if you can know this standard in such a way that there is no dispute about it. If intelligence is under consideration, you will need a measurement of intelligence of greater reliability than the estimate of the street or even of the school. If more accurate adjustment of teaching is needed than that which can take place through the mere knowledge that a child is above or below type, such an adjustment clearly cannot be made unless we know how much he deviates from type. If you will apply what I have just said not only to intelligence but to abilities of all sorts, to appreciations, attitudes, and skills in all the subjects and parts of subjects with which the school deals, and if to these you will add the physical as well as the mental and emotional qualities, you will find, I think, that standards, instead of formalizing your work, will in reality make you intelligent about it. I think you will find that your attitude as teachers becomes less rigid, that you tend to do less mass teaching and more individual teaching, that you tend to know each of your pupils intimately and expertly, and that with this knowledge you become versatile in the technique of teaching.

The opposite condition is well illustrated by the small boy who came home from school with a bad report card. It was evident that he was at the bottom of his class. The father was much concerned and he undertook to labor with the boy, trying among other things to inspire him with an ambition to stand at the head of his class. The futility of the procedure became apparent, however, when the boy summed up the situation by saying: "What's the use, dad? They teach the same thing at both ends of the class."

I have said that the issue is between good standards and bad standards. One of the qualities which makes a standard good is definiteness. What do we mean when we say that a child is bright, or that a teacher's salary is high, or that a textbook is well planned? Do we not each of us have worked into our consciousness a sort of standard by which we judge these things? Yet, to a large degree these standards differ and in consequence, though we use the same terms, we use them with different meanings. Our judgment of salaries or of the heights of men, or of the ability of children to spell would be very much refined if our concepts in respect to these things had been carried out upon identical original data. Suppose, for example, we had gathered measures of the heights of Anglo-Saxon men—men whom we had never seen and whom other people measured for us, vastly extending by these means the range and number of our observations beyond those which we could possibly have made personally. From these measurements we should be able to determine the average height of these men, and, owing to the large number of cases at our disposal and the precision of the method applied, the result would undoubtedly give us a far more accurate notion of the "Man of Average Height" than mere personal experience could ever afford.

But our judgment as to whether a man who is above or below the average shall be called tall or short, and as to whether he is moderately or excessively so, depends not only upon how much taller or shorter he is than the average, but also upon the closeness with which the heights of all men are found to group around the

average. If most men did not depart from the average by more than one inch, then a man who was two inches above the average would unquestionably be tall. He would, in other words, possess height to an excessive degree. But if it were not unusual for men to differ from the average by four or five inches, then a person two inches above the average would not be unusual, and under these circumstances, we should not call him tall.

Those of you who are following me closely will observe that I am reaching toward a statistical treatment of observed data. In all the measurable types of product and process with which the teacher or anyone else deals, judgment concerning amounts depends, in the final analysis, upon two sorts of information. One is the type, to which statistics gives the name, average; the other is the extent to which a thing may depart from its type without becoming unusual. For this idea statistics provides the measure of variability. Both the average and the measure of variability,—that is, both the type and the usual or allowable deviation from it—are standards. These are the kinds of standards which have been conspicuously set up in education as in other fields during recent years. There is nothing far-fetched, nothing cryptic about them. They simulate conceptual activity. The very essence of our intellectual processes is statistical. My concept of a table or a chair is made up of type and variation. But both type and variation must, just as in statistics, be determined by the original observations. My idea of a chair differs from the idea to which you give the same name according to our experience, and also—although this is another story—according to our experiencing natures. But, although our ideas of a chair probably differ to some extent, our experiences, from which these ideas have been developed, are so nearly alike in this locality that we understand each other pretty well when we speak of a chair. But if we talk of skill in typewriting, or ability to add, or a competence in chemistry we all know to what fatal degrees our ideas differ and confound us.

What the measurement movement with its definite standards has really permitted us to do is to think more nearly the same

thoughts when we use the same language. I cannot imagine anyone preferring, in the name of individuality or culture or philosophy, to think less definitely than he may about anything that may become the subject of thought.

Standardization of the right sort—and it is only of such standardization that I wish to speak—was once defined by Judd as "a mode of development which nature has shown to be advantageous." This is a true conception of standardization and we employ it in every act of our lives. The average adult male is about sixty-eight inches tall, and the female two or three inches shorter. Everything about us is adjusted to this and to other similar standards. The carpenter who came in the other day and adjusted coat-hooks in my office did not put them nine feet from the floor nor three feet. He adjusted them to the standard height of human beings. Beds are made to fit the folks who sleep in them. Desks are thirty inches high and chairs eighteen because these dimensions are adapted to human anatomy. Chandeliers are generally—though not always, I am sorry to say—high enough so that we don't bump our heads when we walk under them. The air we breathe is four-fifths nitrogen and one-fifth oxygen. Our hearts beat seventy-two times a minute, and we breathe about eighteen times a minute, yet no one quarrels with these standards. Bodily temperature is standardized, and the variations from it are surprisingly small, yet no one asserts his individuality by craving for his own part something different from ninety-eight and six-tenths degrees.

It is so in education. There is a standard time for teaching reading, and if a child is not six years old mentally we must wait until he is. You cannot teach the theory of relativity to a ten-year-old child because his mentality is not equal to it. You can't get three-year-old children to form a football team, because they have not reached the level of group activity. You do not attempt to teach long division in the second grade nor chemistry in the fifth nor calculus in the eighth. Nature has imposed certain standards which we must observe.

Standards as the expression of nature at work may be likened to habits. They are like habits in a number of ways and in this way particularly: they release energy for other purposes. Let us consider handwriting. This was one of the first school subjects to be standardized. Now, the ability to write is an important skill in the sense that society demands it universally. We cannot easily evade this demand. Accordingly, writing used to be taught with great effort and with great expenditure of time. Moreover every child, no matter how well he could write, continued to try to improve his writing to an indefinite degree.

When, however, the writing scales came upon the scene all sorts of uses began to be made of them. For one thing it was found that writing of quality 12 on the Thorndike scale is as legible as handwriting can be. It is not as pretty as quality 13 and much less so than quality 16 or 17; but if the purpose of handwriting is to be read and if, as was soon admitted, other matters of quality are relatively unimportant, then it really becomes the duty of the school to see that the desired quality is secured and then to make no effort to secure more. Another use that was made of the measuring instruments for handwriting was to find out from people who employed writers and from persons in different walks of life who have writing to do, how meritorious in terms of one of the scales writing should be. It was found that for almost all purposes a quality of 11 on the Thorndike scale or of 60 on the Ayres scale was all that society was demanding. In other words, society does not appear to be requiring writing even of maximum legibility, but is content with somewhat less. Now, if through the instrumentality of the handwriting scale we find that civil service examiners, employers of people to address envelopes by hand, mail-order houses, and people in general in the handling of their personal affairs require no more than a certain specific degree of merit, why should the school be called upon laboriously to develop a greater degree of merit? Why the endless copy-book practice or more recently the equally endless push and pull exercises and rhythmic formation of compact ovals?

Here then we have a project; or, as the Dalton School calls it, a contract. The pupil with full knowledge of what the various qualities of handwriting are—for he has before him the handwriting scale—contracts to attain a perfectly definite goal, a goal which in respect to quality of handwriting meets every reasonable need. Now, quality 11 on the Thorndike scale is reached some time toward the end of the sixth grade by the average pupil. Unquestionably with this objective definitely in view the required quality can be secured even earlier in the school course. At any rate, the standard, we repeat, is like a well-formed habit, reducing effort and releasing energy. In handwriting it permits a pupil to devote additional time to work which is of more value to him than practice in writing will be after he has attained the standard. What I have just said offers an illuminating commentary upon the idea that standards formalize education. It turns out that at least one use to which standards can be put is to limit training in the formal subjects and to release time and energy for higher uses.

Just as in the case of handwriting, so in the case of arithmetic—which is likewise a formal subject—after we have established reliable instruments of measurement we may with some certainty ascertain the degree of skill required to meet the needs of life. I am sure that many schools are continuing to spend time on arithmetic beyond any need which the pupils are likely to have for the subject. Professor Wilson's study comes to mind. He showed that adults have relatively little need for performing operations other than those with whole numbers and fractions of small denominators. Even within the realm of whole numbers, a high degree of skill as manifested by rapid calculation is not ordinarily demanded. An accurate statement of this sort may be made now that we have standards in arithmetic. In terms of the *Courtis Standard Arithmetic Tests, Series B*, the ability to add twelve examples of nine three-digit figures in eight minutes with 85 percent of accuracy is the average performance of the eighth grade. There is nothing to indicate that the school is justified in attempting to develop greater skill than this in addi-

tion. When pupils have met this requirement, they may rightly be expected to devote their time to matters more important than a higher degree of adding ability would be.

On the other hand, there are some lines of school work concerning which our standards do not permit us to assign an upper limit of desirable ability. The standard in reading for elementary school graduates on material of about sixth-grade difficulty is approximately 250 words a minute with an 80 percent accuracy of reproduction. Nevertheless we are justified in attempting to raise these standards. They are points of departure rather than stopping places. Moreover, there is abundant evidence to show that raising these standards is not difficult. The value of rapid reading is so distinctly an advantage both to the child and to the adult that we cannot, as in the case of handwriting, set a limit beyond which we should not go. If we could teach children to read twice as fast as they now do and at the same time teach them to comprehend their reading better than they now do, we should increase enormously their success in high school and their resourcefulness in life.

I have said that standards, both educational and non-educational, are a natural mode of development. My next point is that the standards we use in education must, if they are valid, be based upon experience. We all have standards derived from our experience, although they may waver and elude definition. The teacher has a standard of some kind when she requires work to be done over, or marks it zero, or indeed marks it anything. The business man has a bull-headed sort of standard when he declares that the schools are not teaching the fundamentals. Various reformers have captious standards when they find fault, each after his kind, with the product of the schools. Probably the most frequent of these indictments runs to the effect that the graduates of our schools—it matters little whether we say elementary, secondary, or college—are quite without ability to think. It is because the standards of those who thus rely upon their own point of view are unsatisfactory, it is because one person's experience is narrow, vaguely remembered, and incon-

sistently applied, that the merger of a large number of experiences must somehow take place before we can accept the result as a useful standard.

Accordingly, a standard before it can win our confidence must be based not only upon experience, but upon *organized* experience. It must come out of the lives of a large number of people. It then becomes the voice of many, and as such it is authoritative. The difference between individual and collective standards is the difference between individual and collective government—between one-man power and power resting upon the will of many. The school teacher as an autocrat has had too long a reign. Like the absolute monarch in early states and among backward peoples in modern times, the absolute teacher to the extent that he exists today is an anachronism. There are two ways in which improvement has been brought about. One is the conferring upon pupils of greater responsibility for their own behavior. The other is the adoption of standards as rapidly as valid and reliable standards become available.

If, for example, it is authoritatively decided by pooling experience with thousands of children that in oral reading an eighth-grade pupil should be able to read a paragraph of difficulty 8 on Gray's scale in less than 20 seconds, the adoption of this standard means a square deal for everybody. It is far better, let us say, than a standard such as the following: "The eighth-grade pupil should be able to read distinctly and fluently any piece of narrative or didactic prose or verse in his reader." Such a standard, you will readily agree, leaves us almost as badly off as if we were without any guidance at all. For when is reading "distinct," and under what circumstances is it "fluent?" How many errors of pronunciation may be allowed, how many hesitations and insertions? What passage shall be selected from the pupil's reader? How long shall it be? How difficult? For only by chance will the passages in the same reader be of the same difficulty. Textbook writers are in the wildest confusion in their selection of materials for readers of a given grade. If the decision on all these questions is left to the teacher, there

will be almost as many decisions, and therefore almost as many standards, as there are teachers.

Let us stop a minute on this matter of variation in individual standards, for it is at this point that one of the most illuminating results of the individualist's notions appears. I take it you will agree with me that the person who today opposes the application of standards in education is distinctly conservative. Now, a conservative doesn't like new ideas. Moreover, he doesn't believe they are true. Against a new idea he has three lines of argument: first, the Bible is against it; second, there is something in it but there is nothing new about it; and third, we have always done it. Leaving the Biblical line of argument out of account, I wish to show that there is something new about standards and that we have not always been applying them. Consider the textbook writers in the first place. They are, or should be, especially capable along educational lines. I admit that this point is debatable in many instances, but by and large textbook writers are what the statisticians call a highly selected group.

Now let us return to the question of the difficulty of passages in reading books; and let us raise the question of variation in difficulty in this way: "Are the passages which textbook writers put in the reading books for a given grade of fairly equal difficulty?"

On this point a number of investigators have worked and their conclusions are all to the same effect, namely, that the textbook makers are badly at sea. For example, in examining twenty-two series of readers Hosic found that the story of "The Town Mouse and the Country Mouse" was thought by one author to be suitable for the primer; that three others used it in the first reader; that another used it in the second reader; and that still another used it in the third reader. Again, "The Ginger Bread Boy" was offered in the primer and in the first, the second, and the third reader. Indeed, it was found that no piece which was used by five or more authors was uniformly placed in the same grade. "The common range," says Hosic, "in such cases is four or more grades and some pieces are placed in seven

and eight school years." There is no clear concensus among the authors of readers as to the difficulty which various selections may be supposed to present to pupils. Yet those who deprecate the setting up of definite standards would reject a device designed to make possible an agreement as to the difficulty of reading materials. Two or three investigators have devised series of passages of known difficulty. Their work, except that of Doctor Gray in oral reading, has not been competently done and it has, therefore, not been generally accepted. But there is no inherent reason why we should not have a scale for difficulty of reading materials just as we have a scale for writing, spelling, and arithmetic problems. The method of constructing such a scale is entirely straightforward and the use of it would immensely clarify all our ideas of achievement in reading.

I have offered this bit of evidence concerning the differences among authors of readers, not because I think these men are not keen and alert for all the excellences which they can secure, but because no group of people can avoid differing one from the other as these authors of readers have differed, when, in the absence of standards, they attempt a complex activity. This is one of my answers to the supposed objections of the conservative that "There is nothing new in it," and anyway, "We have always done it."

But I have another answer. If such is the lack of agreement among textbook writers, we may be prepared to believe that the agreement among teachers on these matters would be no greater.

I do not recall any authoritative studies on the judgment of teachers as to the difficulty of reading passages, but their judgment as to the difficulty, the importance, or the value of some other types of school data has been tested and found to be highly unreliable. I wish to remark parenthetically that I am not using the word "teacher" in this connection nor the words "textbook writer" for that matter, with any idea of intimating a special fallibility among a particular class of people. Teachers can judge quite as well as, and no doubt on this class of material far better than, other groups of persons. When, therefore, I speak of

the unreliability of teachers' judgments, I do no more than assert the unreliability of unaided human judgment.

We are accustomed to think of arithmetic as a highly objective study. We are likely to suppose that a teacher's judgment as to whether a child has or has not correctly solved a problem will admit of no variation. If, therefore, I establish an undesirable variation among teachers with respect to arithmetical data, I presume you will be quite prepared to believe that somewhat the same degree of variation may safely be asserted with respect to other data.

Not long ago a certain county superintendent selected a paper which a pupil had written in an arithmetic examination. The paper was on percentage. He mimeographed it and sent it together with the questions to a group of about 100 of his teachers. He asked the teachers to rate the paper. They varied in their ratings all the way from a mark of 10 which one teacher gave it to a mark of 100 which four teachers gave it. Moreover, if 75 had been the passing mark, almost exactly half of the teachers would have failed the pupil who wrote the paper and the other half would have passed him. Evidently it makes a lot of difference into whose hands a pupil falls.

Doctor Ashbaugh in the March issue of the *Journal of Educational Research* gave similar evidence. Forty-nine seniors and graduate students rated a pupil's arithmetic paper, on which the solution of ten reasoning problems had been attempted. Doctor Ashbaugh had his students rate the paper three different times. For the moment, however, I shall consider only the first trial, because in practice a teacher seldom rates a paper more than once. Doctor Ashbaugh reports that the scores of the forty-nine examiners of this paper ranged from 29 to 80. If the passing mark had been 60, about half the examiners would have passed the pupil and the other half would have failed him. There were ten problems in the examination, and six of them appealed to the examiners so differently that some regarded the solutions as perfect while others regarded them as absolutely worthless.

For example, 21 examiners regarded one of the solutions as perfect while 21 others regarded it as worth no credit.

Moreover, besides disagreeing with each other, teachers disagree with themselves. In Doctor Ashbaugh's experiment only *one* of the 49 students, many of whom were teachers, rated the paper the same on the three trials. Only 10 of them—that is, only one-fifth of them—agreed with themselves to the extent of giving the same score twice out of three times. Instances such as the following occurred: one examiner rated the paper 55 on the first trial, dropped to 30 on the second, and came back to 40 on the third. Differences of twenty or thirty points on the part of the same rater frequently occurred.

If in a subject as definite as arithmetic variations such as I have indicated can occur, isn't it time for some sort of standardization to appear upon the scene? Your jealous individualist with his sentimentality and his lack of information merely serves as an obstructionist. To him conformity to anything or anybody is distasteful. He pleads for initiative, and so do I. He wants individuality respected, and so do I. But in the life of today we share many things. We have much in common. There must be common ties to some extent, common ideals, and common purposes. I submit that when a teacher or a curriculum maker or a textbook writer pretends to hew to the line in any particular, he should do the thing he sets out to do. If he rates pupils and ratings are supposed to be uniform, they should be uniform. The standard of uniformity is the standard to apply. If, on the other hand, it is a question of judging the difficulty of material for inclusion in the course of study or in school books, again the standard of uniformity is the standard to apply. A thing is difficult for pupils according to the proportion of them who under given conditions can get it right or in some way react satisfactorily to it. Or, from another point of view, a thing is difficult in proportion to the time it takes under given conditions for typical learners to master it. In either case, difficulty is one thing, and not many. And this one thing—this

degree of difficulty—is not subject to your opinion or mine but is susceptible of exact determination.

The point I am trying to make is that since these standards arise out of the organized experience of school children and school teachers, the thing that makes them desirable as standards —the thing in virtue of which alone they are standards—is their uniformity and objectivity.

Now it appears that the only really effective way in which standards may be set up in definite form as this product of organized experience is through numerical processes. Hence, standards of the most usable sort are quantitative. I do not mean that qualitative standards are inferior. I do not mean that initiative as an objective, or the ability to think, or honesty, or the golden rule are to step down from their high places and make obeisance to the latest numerical index. But I do assert that their lack of precision is not in itself a merit. It affords precisely the same basis of variation and the same uncertainty of application which we have already seen in the case of accuracy in answering arithmetic problems or of difficulty of reading selections. In spite, therefore, of the value of these qualitative standards, I think it may be reasonably maintained that standards are most useful when they are quantitatively expressed. For example, if, merely upon my own experience as a teacher, I assert that eighth-grade pupils should be able to add, my statement is of little value. And even if I summon to my support the experience of many teachers to the same effect, I have still done little toward setting up a useful standard. I have not indicated how accurately such children should be able to add, nor at what rate. Moreover, I have not specified the kind of quantities, nor their size, nor their number. Must the child be able to add fractions as well as whole numbers, denominate numbers as well as decimals? Should he be able to add numbers of one digit or of a dozen? Should he be able to add two numbers or a column as tall as his tablet? The only satisfactory way to arrive at sufficiently definite standards of adding has been by assigning specific tasks to a great many pupils and recording their successes

in performing them. From these records, made in numerical form, we deduce, for example, the Courtis standard, already mentioned: Typical eighth-grade children can add in eight minutes with 85 percent accuracy 12 examples each composed of nine three-place numbers.

Observe that the standard I have just quoted is essentially a numerical statement. So also is the statement that graduates of elementary schools should write as well as quality 12 on the Thorndike scale and at the rate of 70 letters per minute. So also is the statement that eighth-grade pupils are able on the average to spell words of the difficulty of Column U on the Ayres' Scale with 84 percent of accuracy; that they are able to write a composition of quality 5 on the Hillegas Composition Scale; and that they are able to read and respond correctly to 12 paragraphs of the Burgess Reading Scale in five minutes. Many such quantitative statements are possible.

And now having paid my respects, I hope sympathetically, to the standardizing movement as it is usually conceived—to average performances in school subjects, to reliabilities, variabilities, relationships, and all that—I wish to conclude by pointing out that there are still higher and better standards than these—standards which arise just as surely as they do out of life experiences, standards which are higher and truer than they and valid with a validity which they can never have.

Learning is a tool; and as such it is passive. The three R's possess no righteousness. A man may learn to read, but if he reads degrading and debasing things he may be worse than illiterate. Writing may make him a forger, and arithmetic a swindler. Ignorance of these fundamentals is always a misfortune, but knowledge of them may only add to the powers of evil. We evidently need other standards to insure the right use of these abilities. These standards will not be expressed in terms of better or poorer writing, or in more or less of reading or arithmetic. They will be expressed in terms of ideals, of social relationships, and of the meaning of life.

The wisdom of the race has decreed that there are certain elementary skills and abilities extending beyond the three R's

but of which they may stand as a type which must be learned by all who can learn them; and it is sheer nonsense for obstructionists to object to any procedure which will permit them to be learned more quickly and by more people. The wisdom of the race has also recognized that beyond these elementary skills which everyone should have are the fields within which we have choice, fields which minister to our special interests and in the pursuit of which we aim at more abundant living. Any plan which will assure a profitable entrance into these fields for increasing numbers of people, deserves general support. This is the function which exact numerical standards now perform.

But in a sense their function is subordinate. Their rôle is to permit teachers to do well the introductory job of teaching and to leave them time to devote to ethical and social types of instruction. Character and right living remain, as ever, the real objectives; and the education which merely teaches men to make a living while failing to teach them to live is a low order of activity.

It is therefore only as we summon to our aid standards of the highest order that we become educators in the best sense. These highest standards, I wish to insist, are of the same normative type as the standards in terms of school achievement. They are, however, more universal, though less exact; and instead of being drawn from science they are drawn from philosophy. They derive their value from what we conceive life to be.

And so it seems to me that in a complete scheme of education we shall envisage a hierarchy of standards rising one above the other and, as they rise, diminishing in precision and increasing in range. The lower orders have received most attention lately and it was essential that this attention should be given them. There was and still is vast waste in teaching things which should be done with precision and dispatch. If we can now say, as I believe we can, that the child of today obtains by the end of the third grade all the rudiments of reading which the child of the mid-nineteenth century obtained in his entire school life, it is largely because men and women have studied these narrow, spe-

cific standards and have lifted educational practice toward them. But in their attention to these lower order standards, the best thinkers among them have not failed in their allegiance to the higher standards of teaching and of education as a social agency.

On the other hand, signs are not wanting to indicate that the philosopher and the educator of large vision are beginning to

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schools, its library and theater, its laboratories, and gymnasium. Every town will converge upon its cluster of schools and colleges, its research buildings and the like, and it will have its great chapel, its house of vision as its crown and symbol even as the cathedral was the crown and symbol of the being and devotion of the medieval city."

PERSISTENCE OF ERRORS IN ARITHMETIC[1]

G. C. MYERS
Cleveland School of Education

How serious is a mistake? Is an error an accident? Is it just the same as no answer, merely an indifferent quantity? When a child gives a wrong answer to $4 + 7$ is that answer ju[illegible] not 11, or is it something positive and specific? Is the child [illegible] no

[illegible] ne

[illegible] ill

[illegible] ce

[illegible] nd

[illegible] en

[illegible] de

[illegible] ht

[illegible] iis

[illegible] ıe.

[illegible] il-

[illegible] in

[illegible] as

[illegible] :h

[illegible] b-

[illegible] s:

[illegible] *le*

18 (once)	18 (twice)
81 (once)	81 (once)
18 (4 times)	18 (3 times)
81 (once)	81 (once)
18 (once)	18 (twice)

[1] Read before the Educational Research Association on Tuesday, February 26, 1924.

cific standards and have lifted educational practice toward them. But in their attention to these lower order standards, the best thinkers among them have not failed in their allegiance to the higher standards of teaching and of education as a social agency.

On the other hand, signs are not wanting to indicate that the philosopher and the educator of large vision are beginning to see something in these norms of achievement on which so much effort has lately been expended. From being scornful, many of them have become tolerant and even in some cases well informed. They may well be finding that just as their higher objectives give direction to these lower objectives, so the lower give content and substance and practicability to the higher. I like to think that from the most concrete to the most abstract standards we have an unbroken system for appraising our work. In this system each order of standards is supported by the others. The lower orders without the higher are blind; and the higher without the lower are empty.

Among these higher-order standards, the highest, the most potent, the most energizing seems to me to be the level of our thinking in regard to the school itself. I mean its place in society and its significance in civilization. Perhaps you have read H. G. Wells' *Story of a Great Schoolmaster*—the schoolmaster being Sanderson of Oundle. Speaking of this remarkable man, Wells says: "Out of a small country grammar school he created something more suggestive of those great modern teaching centers of which our world stands in need than anything else that has yet been attempted . . . ."

"Before his end he had come to a vision of the school as a center for the complete reorganization of civilized life. . . . In that age of realization every village will be dominated by its schools, its library and theater, its laboratories, and gymnasium. Every town will converge upon its cluster of schools and colleges, its research buildings and the like, and it will have its great chapel, its house of vision as its crown and symbol even as the cathedral was the crown and symbol of the being and devotion of the medieval city."

PERSISTENCE OF ERRORS IN ARITHMETIC[1]

G. C. MYERS
Cleveland School of Education

How serious is a mistake? Is an error an accident? Is it just the same as no answer, merely an indifferent quantity? When a child gives a wrong answer to $4 + 7$ is that answer just not 11, or is it something positive and specific? Is the child who answers wrong apt to answer wrong again in exactly the same way? What assurance have we that an error once made will ever be wholly blotted out?

The writer had his normal-school pupils, during their practice teaching, study their children's errors in reading, spelling, and arithmetic. Each pupil not only recorded the oral and written errors of one or several children, but if an error was once made on any given item, successive responses to that item, both right and wrong, were recorded over an extended period of time. This paper has to do with the study of the arithmetic errors alone.

In addition to these individual records, several hundred children in groups were given, at regular intervals, examinations in the fundamentals of arithmetic. Certain combinations, such as $\begin{array}{r} 84 \\ -12 \\ \hline \end{array}$, occurred in every one of these examinations. From each pupil, then, we had five successive answers to each of these problems given at intervals of one week. Data are given as follows:

Some of the responses *in the order in which they were made* were as follows:

Pupil D. L. of III-A responding to $7 + 7$:

41 (4 times)	14 (7 times)
14 (7 times)	41 (once)
41 (twice)	14 (twice)

Pupil D. L. of III-A responding to $9 + 9$:

81 (5 times)	81 (once)
18 (once)	18 (twice)
81 (once)	81 (once)
18 (4 times)	18 (3 times)
81 (once)	81 (once)
18 (once)	18 (twice)

[1] Read before the Educational Research Association on Tuesday, February 26, 1924.

Pupil F. of II-A responding to $8+5$:

13 (once)	15 (twice)
15 (once)	12 (once)
13 (once)	15 (once)
15 (once)	13 (twice)
13 (6 times)	

Pupil F. of II-A responding to $13-9$:

4 (4 times)	4 (3 times)
5 (twice)	5 (once)
4 (once)	4 (3 times)
5 (3 times)	5 (twice)

Pupil E. of II-A responding to $15-8$:

6 (twice)	6 (once)
7 (once)	5 (once)
5 (once)	7 (once)
7 (once)	6 (once)
5 (once)	7 (once)
6 (once)	6 (once)
7 (3 times)	7 (3 times)

Pupil E. of II-A responding to $15-9$:

6 (twice)	6 (twice)
5 (once)	5 (6 times)
7 (once)	6 (twice)
5 (twice)	5 (twice)

Pupil H. of III-A responding orally to $9+6$:

15 (10 times)	14 (once)
17 (once)	15 (twice)
15 (7 times)	

Pupil H. of III-A responding orally to $11-4$:

5 (once)	6 (once)
6 (once)	5 (twice)
5 (once)	6 (twice)
6 (twice)	7 (once)
5 (once)	6 (9 times)

The written responses for five successive weeks to the indicated examples were:

835	V-B. Child	A.	3465,	3465,	3165,	3465,	3165.
697		B.	3455,	3566,	3556,	3566.	
760		C.	3465,	4465,	3465,	4465.	
324							
849							
3465	V-A. Child	M.	3606,	3566,	3566,	3566,	3566.
		N.	3465,	3505,	3465,	3505,	3465.

63	IV-B. Child	A.	44,	34,	44,	34,	34.	
−29		B.	34,	34,	44,	34,	44.	
34		C.	36,	36,	39,	37,	36.	
		D.	44,	44,	44,	46,	44.	
		E.	44,	44,	44,	44,	46.	
		F.	44,	44,	44,	44,	44.	
		G.	44,	34,	44,	44,	34.	
824								
−635								
189	IV-B. Child	K.	299,	299,	299,	299,	299.	
		M.	299,	299,	186,	299,	211.	
		O.	299,	299,	299,	299,	296.	
		L.	299,	...,	389,	299,	299.	
	V-B. Child	V.	199,	189,	189,	189,	199.	
		R.	89,	189,	189,	189,	89.	
	V-A. Child	A.	188,	188,	188,	188,	188.	
	VI-A. Child	N.	179,	289,	299,	289,	291.	
296	V-B. Child	A.	60682,	60682,	60680,	60680,	60682,	60680.
×305		B.	60880,	60880,	60880,	60680,	60680.	
60680		C.	61080,	60680,	60680,	.....,	61080.	
		D.	60270,	60270,	60680,	60680,	60680.	
	V-A. Child	M.	63640,	63640,	60680,	.....,	63640.	
		N.	50680,	50680,	60680,	60680,	60680.	
		O.	60680,	50680,	60680,	60680,	50680.	
		P.	63640,	63640,	63640,	.....,	60680.	

Although some of these instances are no doubt extreme, it is a significant fact that complex operations such as these are very frequently attended by repetition of specific errors. Every case manifested a pronounced tendency toward this repetition. These records, of course, dealt with very simple combinations permitting obviously simple measures. From these data we may conclude that: (1) A mistake is immeasurably serious. (2) We are never sure that, once a mistake is made, it will not be made again in exactly the same way. (3) A wrong answer in number work is apparently quite as definite as a right answer. As far as habit process is concerned, there is no difference between a wrong answer and a right one. Errors are not negative; they are just as positive as correct responses.

The writer infers that in our prevailing method of number teaching there is an enormous preventable waste, which consists

very largely of leading children to make mistakes, thereby perpetuating them, and then in trying desperately to correct these mistakes. He also infers that most drill work in number is not only valueless but positively a hindrance to learning; that children's errors are rarely matters of mere carelessness; and that the business man complains with reason that we do not teach children even to do simple sums correctly.

Here are some apparent reasons for this tragedy of errors. There is too much so-called reasoning in arithmetic, manifested in teaching number facts and in correcting errors. We take great pains to train children in very faithful habits of counting objects and images, and then we and the children spend almost all the rest of our lives trying to break up these counting habits. We tell children that it is very naughty to count their fingers; that good children count pieces of crayon or sticks or chairs or children or nice red moons or dots or dominoes. If the crayons or chairs or dominoes are not handy, we tell the child he must *think* them, which to him means that he must get an image of them. We have no objection to his wiggling his tongue against his teeth, or moving his fingers, or picturing them in his mind as he thinks: anything, as long as he *thinks*. After he has had a term or two of this "motivated" training in attempting to learn number facts, we tell him that it is not nice to count objects, that henceforth he is just to *think* the numbers and that he should learn to think them quickly. But the child discovers—to his great discomfiture—that when he thinks 4 and 5 noses, or 4 and 5 fingers, or 4 and 5 dots or dominoes, he makes more mistakes than when he thought these numbers with the objects before him. The images he gets in this thinking don't always stay in their proper places. Some images slip away and some foreigners intrude. Images may come and go, but the child's struggle with errors goes on forever.

But these early errors do not seem to disturb the child very much; a mistake is of no consequence to him. His only worry in number work is acquiring more speed. A card is flashed at him and he must say something quickly. He accordingly learns

to manipulate images very rapidly or to be a good guesser. But if he guesses wrong once, he is apt to guess the same thing again.

Our experts tell us that the way to prevent counting is to put on more speed pressure. The assumption is that the stop-watch will drive the child to develop wholly new bonds; that the child who, upon seeing $7 + 4$, has been saying to himself "eight, nine, ten, eleven," will by some magic jump at once to "eleven." As a rule, when a child confronted by $4 + 7$ pauses, he is counting images. Every instance that the writer has investigated supports this belief. This problem, including the relation of quickness of response to accuracy and to the predominance of counting habits, is being studied further.

One remedy for this method of teaching children habitually to count in order to arrive at the simple number facts is to tear out or rewrite some 25 or more pages of most of the arithmetic textbooks written during the last 5 or 10 years, or at least to eliminate the word "speed" or its equivalent and substitute "accuracy." We should eliminate, furthermore, all devices for teaching the number combinations which aim to develop number bonds or facts by making children bow down to sticks and worship images. After the child has been directed into wide number experiences so as to have a thorough knowledge of all of them up to 10, for example, let him learn the combinations involved, mechanically, with no attempt and no easy opportunity to develop the number bond by counting. For example, we want the child to learn from experience the meaning of 7, of 6, and of $7 + 6$; but what we do not want is to have the child visualize a number of concrete objects when he sees or hears 7; nor do we want him to count 7 and 6 together, after he has learned how to do it. We do not want him to learn $7 + 6 = 13$ from these concrete experiences. Here lurks the danger to his number learning. Have the child learn $7 + 6 = 13$ by saying and seeing over and over, "7 and 6 are 13." Let there be no further number project until the fundamental tools of that project are fully mastered. Once the child has learned $7 + 6 = 13$ it is time for

a variety, as great as possible, of genuine problems involving this combination.

The child should also be kept from early use and practice of those combinations which are easily visualized and counted, such as $2 + 1$ and $5 + 2$. One reason why $9 + 7$ is harder than $9 + 2$ is that the child has been taught to count. Terrible to relate, practically all the arithmetic books by gifted authors during the last five or ten years violate this principle. Their whole scheme of number exercises wonderfully promotes image counting. Following these very effective exercises in number counting these gifted authors provide penalties and prophylactics for those bad habits which they have helped to make inevitable.

Let us abolish, moreover, some of the foolish "reasoning" schemes of correcting errors. Bozo pauses on $8 + 4$.

His teacher asks, "Eight and one, Bozo?"

"Nine," he answers.

"Eight and two?"

"Ten."

At last he arrives at "eight and four are twelve."

"Fine, I knew you could do it, Bozo."

As a matter of fact he did not do it at all. He merely went upward, counting one at a time—the very thing we don't want him to do. How many a good teacher thinks she is teaching the child to reason by such a procedure! Another favorite method of correcting Bozo is to set him to working out the problem by counting things. This, if you please, is also called "reasoning."

When Bozo, confronted with $8 + 4$, pauses, tell him quickly "8 and 4 are 12." Do not let him have a chance to answer wrong and do not let his classmates hear a wrong answer. But if by chance he gets it wrong, tell him the correct answer. Let him say after you "8 and 4 are 12," repeating it several times as he hears and sees it, and also have several of those who heard it wrong repeat it. The data given above certainly show that our present method of merely correcting an error is of little consequence.

Another source of the tragedy of errors is the almost universal tendency to take on new combinations before the old ones have been perfectly mastered. In most places the 90 or 100 simple addition combinations are thrown at the II-B child within the space of a few months, and he and his teachers spend the rest of his school life in correcting the mistakes made at this time. Indeed, the average individual never makes these combinations wholly error-proof.

Drill often means testing, and testing on what is learned wrong. Let us look upon drill as over-learning correct bonds, as repetition of correct answers; and let there be enough of this over-learning in the early stages to make the correct answers permanent.

Practice with flash cards may be pernicious. Substitute a small card with $\begin{array}{r} 8 \\ 4 \\ \hline 12 \end{array}$ on one side and $\begin{array}{r} 8 \\ 4 \\ \hline \end{array}$ on the other side, to be put into the child's hands. When the flash card is used it should also bear on one side the correct response, to be shown to the child at the first indication of doubt.

Another harmful practice is the prevailing one of compelling children always to answer something. If the child says that he does not know, he is in substance called a liar or shown that his failure irritates his teacher. The average child rarely fails to give some answer, oral or written. He must. "I don't know" is not in his vocabulary.

In an experiment on I-A children in learning addition facts, Miss Winnifred DeWitz of the Cleveland Observation School, after giving 10 minutes a day for about three months to teaching number exercises, succeeded in having 18 out of 21 children master perfectly 63 of the combinations up to 10; and the other three gave perfect answers to the written test. Children can be taught to discriminate between a right and wrong answer in number work, but our prevailing practice often prevents a child from knowing the difference, and, not being sure, he takes a chance. In number work we have been building a foundation

of intellectual dishonesty that blooms into glorious "bluffing" in high school and college.

The universal marking system which rewards for errors and guesses by ranking an error on a par with no answer is another harmful factor. Tennyson may have been right—I do not know—when he wrote, "'Tis better to have loved and lost than never to have loved at all;" but I am convinced that the idea don't work in learning arithmetic.

The modern mania for speed is stimulated by a short-sighted application of standardized tests which emphasize speed at the expense of accuracy. See what we do: we give an arithmetic test in several cities; we record the number of problems attempted and the number correctly answered; and we look upon the average number attempted as the speed goal and the average number correct as the accuracy goal. The superintendent or supervisor says to the principal or teacher: "Your children do not try enough problems in this test. They are too much worried about getting their problems right. You must teach your children to be better sports; they must learn to take a chance. Give them exercises in dash, in putting down something quickly, for life demands such dash." The speed phase of such tests seems to train courage.

If the children prove to be up to the prescribed standard in this matter of courage and dash, and a little low in accuracy, the prescription is: "A little more emphasis on accuracy." Often it is a matter of both low speed and low accuracy when the experts say: "More time and emphasis on arithmetic." Undoubtedly the alleged improvement of instruction as measured by improved achievement has often been due merely to added time and effort spent on arithmetic. Strange as it may seem, improvement in achievement as measured in standardized tests in arithmetic may come with poorer teaching. Many a teacher has the notion that the way to get improvement is simply to step on the gas, to work a little harder and make her children work harder, with the hope that right answers will keep ahead of wrong ones. Contrary to present tendencies, data are available to show that

the way to arrive at speed in the end is to get accuracy first. But more emphasis on speed means, in the long run, not only less accuracy but also a slackening of speed on account of speeding. About a hundred million Americans have been stopped in learning because of speeding. The practical business man is not interested in the person who can make mistakes rapidly, but rather in the person who can figure rapidly and always be right.

It is recommended, therefore, that standard tests in the fundamentals of arithmetic be scored on the basis of right minus wrong, in order to afford a single measure of achievement, and that the regular classroom number work has been scored in like manner. Suppose a child does as follows with these sums:

4	8	9	7	5
6	3	5	2	8
10	12	14	10	13

The usual marking is 60. Some teachers would give this pupil a bonus because they say, "Dear child, he tried."

Suppose, on the other hand, he does this:

4	8	9	7	5
6	3	5	2	8
10		14		13

In this case he would also be marked 60; but is he not far better off as far as his learning achievement is concerned?

Assuming that the child attempted no silent response to $\frac{8}{3}$, he neither gained nor lost in his learning of addition. If he got it right he gained that unit, but if it was wrong he lost it.

Let 0 stand for no answer to $\frac{8}{3}$, + 20 for $\frac{8}{11}$, and — 20 for $\frac{8}{12}$. In the first instance above, then, the child has lost 40 by the two wrong answers, making his total performance 60 — 40 or only 20, as against 60 for the performance in the second instance where two problems were omitted.

Let us grade number work, then, on the basis of right minus wrong answers. By so doing we shall rather precisely evaluate learning progress and motivate habits of accuracy.

Although we are greatly indebted to standard arithmetic tests for what they have done to make us conscious of objectives and of the large number of errors children make, and for stimulating an interest in the diagnosis of children's difficulties, the available tests in arithmetic are only in a small measure diagnostic. For such purposes let the teacher merely test her children in the primary addition, subtraction, multiplication, and division combinations. It is absurd to try to diagnose a child's difficulties in the addition of $\begin{array}{r} 83 \\ 97 \\ \hline 36 \end{array}$ when he does not know that $7 + 6 = 13$ or to drill him in the multiplication of 395 by 7 when he does not know that 7×9 are 63. Yet almost every child who takes a standard test has failed wholly to master these simple number facts. Why not test them on such facts first?

Any test, however, merely registers the errors after the damage has been done. Therefore the hope of improving instruction in number work is to develop in the teacher habits of keeping careful, continuous records of her children's difficulties, of anticipating them, of helping them to avoid errors, and of effectual correction of each error on its first appearance. This obviously suggests a change in practice teaching from an imitative to an experimental attitude on the part of the student.

Finally, let us no longer look upon mistakes as matters of carelessness. Let us take errors out of the class of motives and morals and put them into the class of habits where they belong; and whatever vexation we may feel on account of children's errors in number work, let us direct it at ourselves for having been the worst transgressors.

A FIRST-GRADE READING TEST[1]

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During the past three years the need for a simple group reading test for the first and second grades has become more and more urgent. In Detroit, as well as in many other places, radical changes are being made in the methods and materials for teaching beginning reading. These changes have been caused mainly by the increasing belief in the efficacy of the project method and the attempt to provide for individual differences. As the new materials and methods were developed, and as the plan of grouping children according to intelligence was being tried out, the need for measuring the effect of these changes on achievement in reading became imperative, but no tests which exactly met the requirements of the situation were available. It became necessary, therefore, to construct a new and simpler type of test.

In deciding on the material to be used several important objectives were set up. The test must be a group test; the scoring must be simple, objective, and not too time-consuming. The type of checking demanded of the pupils must also be simple, and the test itself must be short enough to insure the avoidance of fatigue when used with six- and seven-year-old children. The most important requirement of all was that the test should be so arranged as to measure the type of reading ability that teachers actually strive to obtain in the first and second grades.

The first fundamental ability which all pupils must develop in learning to read is word recognition. The problem of the first two grades, Judd says, is to help pupils to attach meanings to printed symbols, to associate the familiar oral form of words with the new visual form found in books. A first-grade pupil's

[1] The writer wishes to express her gratitude to S. A. Courtis, director of instruction, Detroit public schools, and P. T. Rankin, assistant director in charge of research, for their assistance in the preparation of this material, and to the Detroit elementary-school principals and teachers whose cooperation made it possible to gather the necessary data.

rate of reading and his comprehension of what he reads is determined more by his ability to recognize words than by any other single factor. It was decided, therefore, to make the new test measure the ability to recognize the commonest words used in beginning reading.

Since the development of visual vocabulary by means of games which involve the matching of words and pictures has become such a familiar activity for first graders, the device of matching simple pictures with words and phrases describing them seemed an effective device for a group test. In the preliminary form of the test, each of the three pages contained two vertical rows of pictures with the corresponding words and phrases in a column between them. The pupils were asked to read a word or phrase, find the picture to match it, and draw a line from the word to the picture. Two small sections of the test, one from the beginning and the other from the end, are shown in Figure 1.

The device of checking the pupil's ability to recognize the word and phrase groups by having him draw lines from the words to the pictures proved a simple enough type of response for six- and seven-year-olds to learn easily through a preliminary practice test. This preliminary experimentation showed that the scoring was highly objective, and that a paper could be rated in forty to eighty seconds. The pictures and the marking activity appealed to the children and they took the test in the spirit with which they would play a game.

Selection of Materials

Words were selected from the first five hundred in the Thorndike *Word Book*. These words also had frequencies of approximately fifty in a list of the vocabularies of ten First Readers widely used in Detroit. After eliminating the words which could not be pictured easily, or used in a phrase to describe a picture, the remaining words were classified as nouns, verbs, prepositions, and modifiers. These were then arranged according to their frequencies in the first-reader list. Each group of words was

divided into three classes; for example, the nouns were classified as common, less common, and least common.

The words were then chosen for the ten forms of the test. A certain number of words from each section were chosen arbitrarily; in each case more words were taken from the sections having high frequency than from those of less frequency. Thus

FIGURE 1. DETROIT GROUP TEST IN WORD RECOGNITION

each form contains a certain number of words of high frequency which are common to every other form. The remaining words which differ in the various forms are approximately of equal difficulty because they were selected from sections having about the same frequency. This plan makes it possible to have such a great variety of phrases in the different forms that memorization is prevented without extensively altering the difficulty of the various forms.

The number of words used in the test and the variety of phrases obtained by using them in different combinations is shown in Table I.

TABLE I. NUMBER OF WORDS AND PHRASES USED IN THE TEST

Number of words and phrases per form	40
Total number of words per form	120
Number of different words per form	63
Total number of different words in all forms	111
Total number of different words and phrase groups	271

Validation of the Test

Every test-maker must assume the responsibility of determining the validity of his test; that is, the degree to which it measures what it is supposed to measure. The specific problem in this case was to discover whether or not the test yielded a valid measure of the pupils' ability to recognize common words. Validity may be determined by correlation with some valid criteria outside the test itself. In this test it was also necessary to study the effect of the pictures used.

To determine the adequacy of the pictures prepared for use in the test, I-B,[2] I-A, II-B, and II-A pupils were asked to tell what each picture represented. In every case in which the child's response differed from the words used in the test, a record was made of just what was said. The different responses for each picture were tabulated and all pictures which did not represent clearly what they were designed to represent, were redrawn.

The pupils were also asked to find the pictures, when the examiner read orally the corresponding word or phrase group. Since this response is exactly what is required in the test with the reading difficulty removed, it was very interesting to find that from a possible 1,200 responses, only 8 were incorrect. Eighty-four percent of the pupils tested in this way found every item correctly; 6 percent found 39 out of 40 correctly; 10 percent found 38 out of 40; none found less than 38. From these

[2] "B" attached to a grade numeral refers to the first half of the grade, "A" to the second half. That is, I-B means low first grade and I-A means high first grade.

two studies it is believed that the pictures are adequate in the final forms of the test and that variations due to the misinterpretation of the pictures will be practically negligible.

Two measures of the validity of the test as a whole were also found, one the correlation between the teacher's estimate of the pupil's ability and the other the correlation with the pupil's oral reading of the words and phrases in the test.

Since different teachers' judgments of reading ability differ so greatly, certain specifications were given the teachers for their guidance. These were:

Mark 1 those who can read fluently *The Book of Toys and Plays.* (This was the simplest pre-primer material used in the city.)
Mark 2 those who can read in addition the *Aldine Primer.*
Mark 3 those who can read fluently any primer material.
Mark 4 those who can read fluently the *Aldine One.*
Mark 5 those who can read fluently any first-reader material.
Mark 6 those who can read easy second-reader material.
Mark 7 those who can read any second-reader material.

The Pearson product-moment correlation between the test scores and the teacher's ranking of the pupils in these seven groups is shown in Table II.

TABLE II. RELATIONSHIP BETWEEN TEST SCORES AND TEACHER'S RANKING

Form	Number of Cases	Median of Test Scores	Sigma of Test Scores	Median Rank	Sigma Rank	r	P. E.
A.....	618	21.6	2.5	5	1.9	.741	.012
B.....	586	22.4	2.4	5	1.9	.741	.012

Corrected for attenuation due to variations in teachers' ranking the correlation becomes 0.83. This shows that there is a close relationship between ability in reading as judged by these teachers and word recognition as measured by this test.

The most common method which teachers use to determine progress in learning words is to test the pupils individually with flash cards. The writer was curious to know how closely the results of such an individual oral test would correspond with the results from the word-recognition test. One hundred and twenty-

six pupils took the test according to directions, reading silently and marking the pictures. They then read the words and phrases orally without any reference to the pictures. They were allowed to attempt as many as they could in this oral reading. The results are given in Table III.

TABLE III.* RELATIONSHIP BETWEEN TEST SCORES AND INDIVIDUAL ORAL READING OF TEST MATERIAL

Grade	Number of Cases	r	P. E.
I-B.....	51	.93	.012
II-B.....	52	.70	.055
II-A.....	23	.72	.068

* On account of lack of time, no pupils in grade I-A were tested.

The differences between the means on the two tests were 1.0, 3.0, and 2.4 for I-B, II-B, and II-A, respectively; the differences between the sigmas were .3, 1.3, and 2.2, respectively. The distributions of oral scores had the larger means and the smaller sigmas in each case.

These data show that the test will differentiate the pupils of a class into groups in four minutes nearly as well as can be done by the laborious method of testing each pupil individually.

Measures of Reliability of the Test

Doctor McCall defines reliability as the amount of agreement between results secured from two or more applications of a test to the same pupils by the same examiners. One method of determining reliability is self-correlation or the computation of the coefficient of correlation between two series of scores secured from two administrations of the same or duplicate tests to the same pupils. The nearer the coefficient approaches unity the nearer the test approaches perfect reliability. Of course, it is impossible to have a test which is absolutely reliable because there must always be certain forces operating which the test-maker cannot control. It is possible, however, by statistical methods to eliminate some of these factors, such as practice

effect and slight differences in the difficulty of forms, to determine within what limits the test is reliable, and to allow for uncontrollable variation in the effort of pupils, in fatigue, and the like.

The procedure utilized in the case of this test is summarized in the following steps:[3]

1. In grades I–B to II–A, 1,189 pupils were tested. Each class was divided arbitrarily into two groups, and half were given Form A, while the other half had Form B. The following day half of the pupils who had taken Form A the first time took the same form again, while the other half took Form B. In the same way half of the pupils who took Form B the first time took Form B again, and the other half took Form A. The papers from these four groups were labeled A–A, A–B, B–B, and B–A, respectively.

2. After experiment four minutes was decided upon as the most satisfactory time allowance.

3. Pupils were then matched according to grade, intelligence, and score on the first trial. Fifty sets of matched cases in I–B were obtained, 25 in I–A, 25 in II–B, and 30 in II–A.

4. The correlation coefficients showing the relationship between scores on the first and second trials were computed for each group and grade. These correlations ranged from 0.27 to 0.88 with an average at 0.66. The probable errors ranged from 0.11 to 0.02.

5. Differences between means were likewise computed. They are shown in Table IV.

TABLE IV. DIFFERENCES BETWEEN THE MEANS OF FIRST AND SECOND TRIALS

(In every case the second score is greater than the first)

Grade	Forms			
	A–A	A–B	B–B	B–A
I–B	3.2	2.8	3.7	1.3
I–A	7.2	1.6	3.0	4.8
II–B	4.2	2.0	7.6	4.1
II–A	6.5	6.4	8.6	6.1

From this table it may be shown that Form B is slightly easier than Form A. How much easier may be computed by the following equations:

$$P + D = M_{B-A} \qquad (1)$$

$$P - D = M_{A-B} \qquad (2)$$

[3] Only forms A and B were printed at the time this work was done; hence these measures are limited to these first two forms.

In this formula P is practice effect and D is difference in difficulty. M_{B-A} is the difference between the means of Form A and Form B when A is given first (Column A-B of Table IV), while M_{A-B} has a similar meaning when B is given first (Column B-A). Equation (1) expresses the fact that the score in the easier Form B exceeds the score in Form A because of two facts which work in the same direction—namely, practice effect and difference in difficulty. On the other hand, equation (2) expresses the fact that the mean of the more difficult Form A exceeds the mean of Form B by as much as the practice effect from taking Form B exceeds the difference in difficulty between the two forms. In other words, according to equation (2) practice effect and difference in difficulty operate against each other.

Substituting the differences between the means for grade I-B as given in Table IV, we have

$$\begin{array}{rr} & P+D=2.8 \\ & P-D=1.3 \\ \hline \text{whence,} & D=\ .75 \end{array}$$

D for each grade as thus obtained is as follows:

	Words	
I-B	0.75	(A harder than B)
I-A	1.6	(B harder than A)
II-B	1.1	(A harder than B)
II-A	0.5	(A harder than B)

It is believed, therefore, that variations in results due to inequalities between the two forms of the test are not likely to exceed one point plus or minus on the test scale.

On the other hand, we may solve equations (1) and (2) for P. Thus, the practice effect when the second test is given one day after the first is:

	Words
I-B	2 to 3
I-A	3 to 5
II-B	4 to 6
II-A	6 to 8

Table V shows in part the number of repetitions of the test necessary to secure a correlation of 0.8. In computing these repetitions, Spearman's prophecy formula was used.[4]

[4] McCall, W. A. *How to Measure in Education.* New York, Macmillan Company, 1922. p. 371.

The facts regarding the correlation between two testings with the same form and with equivalent forms are summarized in Table V. From this table it is evident that the correlation between two testings with the same or equivalent forms is highest in I-B and decreases gradually through the II-A, although there is a substantial correlation throughout. It is believed that this decrease is due in part to the fact that the distributions for the higher grades tend to skew to the upper end of the scale with a smaller sigma. As the practice effect is greater with these older children, many reach a score of 40 (the highest possible score) on the second trial. The distribution, therefore, for the second

TABLE V.

	I-B	I-A	II-B	II-A
Average correlation between two testings with same form	.82	.62	.58	.48
Number of repetitions necessary to secure correlation of .8	1	2.4	2.8	3.2
Average correlation between two testings with equivalent forms	.86	.77	.72	.36
Number of repetitions necessary to secure correlation of .8	1	1.1	1.6	6.5

trial is cut off abruptly at the upper end on account of the limitation of the test. Under these conditions the correlation coefficient is lowered, because chance errors constitute a larger proportion of the total variation.

Another method of determining the relationship between two variables—a method which has been used a great deal by Mr. S. A. Courtis—is to compute the index of correspondence. This measure of relationship is a little more easily interpreted than the correlation coefficient because it shows directly the degree to which individuals maintain the same relative position in a second testing which they held in the first testing. This position is measured in terms of sigma.

The method of computing the index of correspondence is summarized in the following steps:

1. The mean and standard deviation for each distribution were found.

2. The deviation of each individual score from the mean on both the first and second trials was estimated.
3. Each of these deviations was divided by the sigma of the corresponding distribution.
4. The differences between these quotients were found for each pupil.
5. A distribution was made of the differences.
6. The ranges necessary to include the middle 50 percent and the middle 90 percent of the differences were found. These are indices of the degree of correspondence.
7. These indices were multiplied by sigma.

The indices of correspondence for Groups A-A, A-B, B-B, and B-A, are given in Table VI.

TABLE VI. INDICES OF CORRESPONDENCE EXPRESSED IN TEST ELEMENTS

	I–B	I–A	II–B	II–A
	For 50 Percent of the Cases			
A–A	2.5	3.6	2.6	2.9
A–B	2.3	2.1	2.9	2.4
B–B	2.7	2.6	2.8	3.0
B–A	2.7	2.7	3.0	4.1
Mean	2.5	2.7	2.8	3.0
	For 90 Percent of the Cases			
A–A	5.1	7.6	6.6	5.7
A–B	5.9	5.8	7.0	5.2
B–B	6.5	5.9	7.9	9.5
B–A	5.6	5.1	6.2	9.1
Mean	5.7	6.0	6.9	7.3

Table VI is interpreted as follows: Fifty percent of the pupils in the A-A group did not vary their positions in the second trial of the test more than 2.5 words. Ninety percent of the pupils did not vary more than 5.1 words.

The means for the four grades, 2.5, 2.7, 2.8, 3.0 for 50 percent of the cases, are quite consistent. It is safe to assume, therefore, that knowing the pupils' scores on their first trials, one could predict in 50 percent of the cases, their scores on the second trial within 3 words, or to state the reliability of the test in another way, the displacement of pupils' ranking in the second

trial of the test is for 50 percent of the cases less than 3 words and for 90 percent of the cases approximately 6 words. If more accurate results are desired for individual scores, Table V may be referred to for the number of repetitions of the test necessary.

TABLE VII. CORRELATION BETWEEN ODD AND EVEN ITEMS ON THE TEST

Grades	Ages	Sigma Odd	Sigma Even	r	P. E.	Number of Cases
I–B, I–A, II–B, II–A	All	5.9	5.1	.955	.003	554
I–B	6, 7, 8	5.1	5.1	.950	.005	163
I–A	6, 7, 8	4.2	5.0	.927	.008	138
II–B	6, 7, 8	3.7	3.0	.839	.020	107
II–A	7, 8, 9	3.3	3.1	.956	.005	146
I–A	6	4.8	4.3	.972	.005	49
I–A	7	4.8	4.1	.959	.006	71

TABLE VIII. NORMS ON DETROIT WORD RECOGNITION TEST SEPTEMBER

	Initial Testing							
	Number of Cases				Medians			
	X	Y	Z	Total[a]	X	Y	Z	Total[a]
I–B	332	838	219	1,587	3.5	2.7	2.2	2.7
I–A	500	971	381	2,167	15.3	9.8	7.4	10.2
II–B	639	1,312	572	2,859	25.1	17.8	12.0	17.8
II–A	581	1,001	545	2,306	31.8	24.1	17.6	24.7
III–B	420	983	361	2,114	35.1	29.8	24.8	30.3
III–A	152	111	26	1,339	36.4	33.3	32.0	35.7
	Final Testing							
I–B	915	2,009	781	4,108	16.9	12.1	7.0	11.6
I–A	482	995	483	2,211	28.8	20.1	13.8	20.4
II–B	722	1,352	627	2,926	34.4	28.2	19.8	28.3
II–A	712	1,099	469	2,425	36.8	33.1	29.0	33.6
III–B	399	998	361	2,192	37.7	36.6	34.3	36.6
III–A	135	138	54	1,192	38.0	36.8	33.7	37.2

[a] Includes the X, Y, and Z groups and, in addition, a number of unidentified children.

To determine the consistency of the test the correlation between the odd and even items of the test was found. The results for groups of various degrees of homogeneity are shown in Table VII. It is noticeable that the correlation remains just as high when a highly selected group is used as when all the cases of all ages and all grades are massed.

Norms

A comparison between the initial and final scores of three intelligence groups,[5] X, Y, and Z, for grades I-B to III-A, inclusive, is given in Table VIII.

Conclusions

1. The Detroit Group Test in Word Recognition[6] provides a means of measuring the control of first- and second-grade pupils over a fundamental ability in reading, namely, the ability to recognize common words.

2. The material of the test was carefully selected and arranged from a scientifically derived vocabulary.

3. Ten forms of approximately equal difficulty are available. The exact variation in difficulty between Forms A and B has been determined and the same data will be gathered for the other forms as soon as they are in use.

4. The validity of the test has been proved (1) by careful checking of the pictures used, (2) by correlation of the test scores with identical pupils' oral reading of the test words and phrases, and (3) by correlation with teachers' judgments of pupils' reading ability.

5. The reliability of the test at various grade levels has been determined (1) by finding the correlation coefficient and also the index of correspondence between two testings of matched pupils with identical and equivalent forms, and (2) by determining the correlation coefficient between the odd and even items of the test.

The test has served a variety of purposes in Detroit. It was used first as one means of measuring the effectiveness of reading material planned for the Z group. Later, when the demand came for standards in reading for X, Y, and Z groups it was an

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[5] In Detroit, children entering the first grade are given a group intelligence test and grouped into fast, average, and slow moving sections on the basis of the scores made. This classification is later modified as experience proves necessary. In general, the X-section corresponds to the upper 20 percent, the Y-section to the middle 60 percent, and the Z-section to the lower 20 percent of the children.

[6] Published by World Book Company, Yonkers-on-Hudson, New York.

effective instrument for bringing to the attention of teachers and principals, the overlapping in the achievement of children of different levels of intelligence, thereby stimulating the formulation of the new plan of promotion adopted in this city. Still later, when the Picture Story Reading Method was being used, it was possible by means of this test to compare the growth curves in word recognition of the pupils using the new material and those using the conventional material by measuring them at regular intervals throughout the term. The test has also been given as a city-wide test for several semesters for the purpose of gathering data concerning the rates of growth of X, Y, and Z groups.

A STUDY OF THE ABILITIES OF VOCATIONAL-SCHOOL PUPILS

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THE PROBLEM

In 1911, by legal enactment, Wisconsin established part-time schools for the education of wage-earning boys and girls between the ages of fourteen and sixteen. So fast, however, did vocational education appear to justify itself that the statutory requirements were subsequently raised from a school attendance of four hours per week to half-time attendance for children between fourteen and sixteen and to eight hours per week for those between sixteen and eighteen. In 1911, a work permit was obtainable upon completion of the fifth grade or school attendance of seven years. At present the work permit is issued upon completion of the eighth grade or school attendance of nine years, exclusive of the kindergarten. At the age of sixteen a permit may be issued regardless of school progress.

The part-time school presents an array of children more widely varying in capacities, abilities, and needs than those of the full-time school. Hence the problems of organizing and administering the part-time school are extraordinarily difficult. Any organization and administration must take into consideration (1) the mental and physical endowment of the children, (2) local community needs, and (3) the children's occupations. Other factors operate in determining curricula, but the first of the above is the most important. To give these boys and girls, who spend only a limited amount of time at study, the things they can do and the things they most need is the objective. In order to meet the needs of individuals, we require much information as to their intelligence levels and school achievements. Thus far, such surveys as have been made have been chiefly of the inventory types. Reports rather than studies have been the vogue in Wisconsin and elsewhere. Investigation and research

are badly needed. How do the mental abilities of part-time and full-time pupils compare? Have the part-time pupils dropped out of the full-time school for lack of native ability? What percent of them possess superior intelligence? Are the variations in their mental capacities such that modifications in ordinary group methods are necessary? What is their ability to read? What are their abilities in arithmetic? Are there any who cannot possibly profit by attendance? These are matters that need determination before adequate curricula can be provided.

As a partial attempt to answer the foregoing questions, a study was made of the abilities of vocational-school pupils of two Wisconsin cities. The results, although they are in no sense final, are at least suggestive of further investigation.

Tests and Results

During the school year 1922-23 the Terman Group Test of Mental Ability was given to 190 pupils in the two cities, the Woody-McCall Mixed Fundamentals Test to 220, and the

TABLE I. MEDIAN CHRONOLOGICAL AND MENTAL AGES

Schools	Chronological Ages	Mental Ages	Number of Pupils
A	16–8	12–8	156
B	16–3	13–0	34
A and B	16–7	12–9	190

Thorndike-McCall Reading Scale to 213. The discrepancy in numbers is due to the continually shifting vocational-school enrollment. It took about two weeks to administer one test to an entire school. Since low scores are often attributed to an unnatural situation in which pupils are placed, in this study the tests were given by the teachers under whom the children worked and in their own classrooms. Four months before these tests were given, the larger of the two schools had been tested with Forms A and B of the National Intelligence Test. A large number of the pupils were, therefore, somewhat "test wise."

The results of the Terman Test are given in Tables I and II, Table I showing the median chronological and mental ages, and

Table II the median test scores and intelligence quotients. The striking facts of Tables I and II are the median mental age of 12 years 9 months, the median chronological age of 16 years 7 months, and the median intelligence quotient of 80.

TABLE II. MEDIAN SCORES AND INTELLIGENCE QUOTIENTS (TERMAN GROUP TEST OF MENTAL ABILITY)

Schools	Scores	Intelligence Quotients
A	61	79
B	70	82
A and B	63	80

The results with the Thorndike Reading Scale, giving the median T-score and reading quotients appear in Table III. The T-scores are derived from the number of questions answered correctly. Norms in terms of T-score have been established from which reading quotients can be derived. For example, a T-score

TABLE III. MEDIAN T-SCORES AND READING QUOTIENTS (THORNDIKE-MCCALL READING SCALE)

Schools	T-Scores (Reading)	Reading Quotients	Number of Pupils
A	53	79.5	172
B	49	76.5	41
A and B	52	79	213

of 25 indicates a reading age of 6 years 7 months; a T-score of 50 indicates a reading age of 12 years 6 months. The reading quotient is the reading age divided by the chronological age.

The meaning of the reading quotients is set forth in Table IV, which gives the distribution of quotients according to the Thorndike-McCall interpretation table. The significant fact is that the median reading quotient of the vocational-school group falls at 79, indicative of inferior reading ability, with 39 percent of the pupils very inferior and exceptionally inferior and with only 12 percent reaching or exceeding average ability.

The results of the Woody-McCall Mixed Fundamentals Test, giving the medians by schools and by sex, appear in Table V. The meaning of these scores and especially of the distributions from which they arise will be evident from an inspection of Table VI. Here the number of problems solved correctly is related to the grade level corresponding to this performance. In this table is also shown the number of pupils whose performance was at or below each grade level.

Discussion and Conclusions

The results of the tests as tabulated show a very similar situation in the schools of the two cities. According to the Terman

TABLE IV. INTERPRETATION OF READING QUOTIENTS

Reading Quotient	Interpretation	Number of Pupils	Percent of Pupils
Below 55		10	4.7
55–65	Exceptionally inferior	26	12.2
65–75	Very inferior	47	22.1
75–85	Inferior	68	31.9
85–95	Low average	36	16.9
95–105	Average	17	8.0
105–115	High average	8	3.8
115–125	Superior	1	0.4
125–135	Very superior	0	0.0
135–145	Exceptionally superior	0	0.0
Total		213	100.0

TABLE V. MEDIAN SCORES IN THE WOODY-McCALL MIXED FUNDAMENTALS (220 PUPILS)

School	Median Score	
	Boys	Girls
A	24.4	23.8
B	22.2	25.7
A and B	23.9	23.9

Test, the median mental age in one city was 12 years 8 months and in the other 13 years. The median intelligence quotients were 79 and 82 respectively. The median reading quotients were 79.5 and 76.5; and the results in arithmetic showed a difference of but 0.2. One of the cities is predominantly industrial with an

unusually large proportion of the laboring class. The other city, since it has a very heterogeneous population, is more difficult to characterize. The results, however, indicate that the student elements of both vocational schools are equivalent in native ability and in school progress.

The median ability of these pupils in arithmetic, as shown in Table V, was 23.9, which, as indicated in Table VI, is considerably less than sixth-grade ability. Only 25 pupils out of 220 exceeded the ability of the normal eighth grade, whereas 49 had fourth-grade ability or less. The wide range in this test is significant. An appreciable number are lower than the third grade.

TABLE VI. NUMBER OF PUPILS AT OR BELOW INDICATED GRADE LEVELS ON THE WOODY-MCCALL MIXED FUNDAMENTALS

Grade Level	Corresponding Number of Problems	Number of Pupils at or Below Indicated Grade Level
II.	5	1
III.	13	16
IV.	18	49
V.	22	97
VI.	25	146
VII.	28	174
VIII.	30	195

Table reads: The typical second-grade pupil can solve five problems, and one pupil was either below or at this level.

It cannot be expected that those in the lower half of the distribution will be able to pursue with much profit subjects in which more complex mathematical processes are required. The pupils who blunder so badly in simple decimals and fractions are not likely to make much progress in mechanics, scale drawing, shop mathematics, or allied subjects.

The deficiency in reading ability, as shown in Tables III and IV is distressingly bad. When we remember that a reading quotient of 100 is the norm, the median score of 79 becomes very significant. Success in academic subjects depends upon assimilative reading power. Where reading is laborious, hesitant, and inaccurate, it is next to impossible to get intensive reading or to develop a desire for extensive reading. To pupils of such a low order of reading ability the beauty of the masterpieces can

make no appeal; to them the biographies of great men and women can never be an inspiration; and to them the printed sources of civic intelligence can be no guide. That inferior reading ability will create a distaste for reading seems a natural consequence. Of 210 pupils included in the tests, only 54 were patrons of the public library, according to the borrowers' cards at the charging desk. We tend to do things that we do well. Enjoyment and pleasure are derived from excellence and ability to work with definite results.

As to the general intelligence levels of this group, Tables I and II suggest conditions contrary to claims advanced affirming the quality of part-time and full-time pupils. Undoubtedly such claims are based upon opinion rather than upon unbiased observation and investigation. High student mortality has always been a perplexing problem. Since the advent of part-time schools, the "drop-outs" have entered the vocational school. Remembering too that student mortality is due more to failures than any other cause, it is clearly evident that the average ability of both schools cannot be on a par. Every pupil who fails in the high school or upper grades and who enters the vocational school raises the average intelligence level of the full-time school and lowers that of the part-time school. This alone would disturb the equality if equality really existed. But there may be an original variation between the groups which accounts for their school position. According to the tables, the median chronological age is 16 years 7 months and the median mental age is 12 years 9 months. The median intelligence quotient is about 80. Students of the subject seem to be agreed that a pupil with an intelligence quotient less than 90 cannot do creditable work in high school. The scores obtained in this study would therefore indicate that a large majority of these pupils could not advantageously pursue high-school courses.

Despite these conditions, most vocational-school philosophy and development is based upon the sublime faith that pupils of the part-time school are equal in ability and capacity to those of the full-time school. If vocational education hopes to assume an unassailable position, its courses of study must be constructed

upon a frank recognition of the abilities of its pupils. Consideration of mental levels together with previous school progress should be the directive influence in building differentiated courses of study for these schools. To proceed upon the supposition that anything is possible for any child is as unprofessional as it is wasteful. Educational practice is under fire; and to dismiss the subject with the accusation of educational fatalism is merely dodging the issue. The part-time schools need well-defined aims. At present there appears to be no unanimity of purpose. It is held by many that the primary function of part-time schools is to train for the trades; others hold that their chief business is to endow pupils with a broad and liberal training. Leaders of the movement are beginning to realize that there has been undue emphasis upon trade work. They affirm that the vocational school should be a place for the student to find himself. This is a hopeful sign, indeed. There is a danger, however, that the finding process may become aimless browsing among subjects and shops, without purposeful contact. Limited hours of attendance demand that if there is to be genuine realization of opportunity each hour must contribute its quota. It is necessary in order to provide proper guidance that data be at hand relative to the abilities of pupils. An analysis of trades will assist materially. Having such records for reference, courses can be constructed upon correct scientific principles. On account of the great variation in ability, a new type of work must be provided for the lower levels of intelligence. Honesty and willingness to face facts rather than desires, hopes, or sentiment, should actuate the treatment accorded the latter class. Any attempt to ignore the facts is evasion and negligence.

A new program for the part-time school needs to be formulated. When expressed, it should be supported by the findings of thorough state-wide surveys of pupil material. A recent grant of federal aid to the State Board of Vocational Education for research will make possible the beginning of a study of conditions in Wisconsin. The future of vocational education depends upon the open-minded and careful study which its importance deserves.

A COMPARISON OF PRACTICES AND PURPOSES OF LIBERAL ARTS COLLEGES

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It seems needless to revive the debate regarding the meaning of liberal education or culture. We are all fairly agreed as to what that something is—no matter what we name it—in the possession of which we find the measure of a man's progress along the road of civilization. Nor shall I dwell in merely general terms upon the purpose of that phase of education designed to speed up this progress of man.

Instead, I shall state in somewhat analytical terms, the purpose of liberal arts and sciences. With this statement nearly all will agree. From it I shall attempt to make certain deductions concerning correct educational procedures; and in the light of these deductions, I shall then view certain present educational practices.

The privilege of spending six months, March to September, 1923, in a study of certain aspects of colleges of arts and sciences, was afforded me by the aid of a subvention from the Commonwealth Fund. The statement of the aims and purposes of a college which follows I submit after a survey of educational literature dealing with the aims of cultural education; after many discussions with college teachers; after a study of seventeen statements of the purposes of the arts college, submitted by as many deans; after perusing the interesting answers from forty-three rather distinguished citizens, graduates of eleven different colleges; and after examining the replies concerning aims of high schools from fifteen principals of as many large high schools. I believe that in this statement are embodied the essentials agreed to by most thoughtful persons.

AIMS OR PURPOSES OF THE COLLEGE

In addition to preserving health, which is the basic demand of any educational system, there are three fairly distinct functions of the college.

Preparatory.—Throughout the educational process, opportunity must be afforded for the mastery of the tools of learning by which progress into the higher reaches of knowledge can be assured. The college must take up this task where the lower school leaves it, and the extent of study devoted to a tool subject by any student should be determined by the use the student is expected to make of it. Among these tools may be listed:

1. The mother tongue, both spoken and written
2. Foreign languages
3. Figures and mathematical formulae
4. The language and symbols used to express the fine arts—music, drawing, painting, design, etc.

Cultural or non-vocational.—As soon as a child gains any facility with the tools of learning, he begins the assimilation of culture—learning to live better as a member of the family, community, state, nation, and the world. The college is the final unit in the regularly organized educational system to achieve this end. The limit to the extent of study for culture is either imposed by individual necessity in taking up the task of earning a living, or imposed by social welfare—the age at which entrance upon earning or preparation to earn is of greatest good to society as a whole. To satisfy the first it is essential that vocational training in those callings not so dependent upon wide general education be available to students at various ages—say from sixteen years up. The second demands more study by sociologists than has yet been devoted to it before the problems involved can be determined. Pending such a study, cultural education in elementary school, high school, and college will occupy all the time left between the mastery of the tools of learning below and the vocational or professional training above. The part to be played by the college dovetailing with and enlarging upon the work of the lower schools is to make as much progress toward the following goals as the time which the students devote to college makes possible:

1. A social viewpoint—the appreciation of one's responsibility for social progress

2. Perspective—the information, the social experience and the aesthetic appreciation required for judgments in line with social progress
3. Initiative—required to insure against indifference or inaction
4. Intellectual training—required to assure a trustworthy solution of new problems
5. Self-mastery—required to assure conduct in line with one's principles

Vocational—At the appropriate place in the educational training of every young man or woman, opportunity to prepare for earning a living should be available, either by apprenticeship or in vocational and professional schools. What part of this vocational training should be given within a college organization is determined largely by the exigencies of the situation. It is not an intrinsic part of a liberal arts and science curriculum. Economy, however, and probably efficiency as well, prompt the inclusion within the college of the following: (1) such knowledge and skill in vocations largely dependent upon general culture as will most nearly assure success in a given vocation with a minimum term of apprenticeship; and (2) those pre-vocational studies which are basic for the specialized curricula, but which are not themselves specialized to any considerable extent.

Implications Which Follow from the Foregoing Statement of Aims

There are very important distinctions called for by the fact that the aim is threefold—that it is preparatory, cultural, and vocational. The desired outcome of the college work whose aim is preparatory is largely the facility of its use in cultural or vocational study; the desired outcome of that college work the aim of which is cultural is largely subtle changes in personality; while the desired outcome of vocational college work is largely knowledge and skill for meeting vocational situations. Certain conclusions are justified in the light of these facts.

In the first place, since the three types of courses have different aims, the methods by which they are taught should likewise be different. (1) The keynote of the method for the preparatory courses is memory, requiring mainly use and practice.

(2) The keynote of the method for the cultural courses is interpretation or thinking, requiring interest and participation. (3) The keynote of the method for vocational courses is systemized information plus practice in the application of this information to vocational cases. This requires large equipment, opportunity for specialized study, and intimate contacts with vocations.

In the second place, the training of teachers for the three types of courses should be different. (1) For preparatory courses, the teacher has little use, except as a cultured man or woman, for broad cultural training, but needs special training in the methods of securing lasting memory. (2) For cultural courses, the teacher has equal need for broad cultural training by means of which he can interpret life for his students, and for knowledge of his students that he may adapt his materials suitably for their interpretation. A teacher who is mainly a specialist in some department of learning, and who gives chief attention to his subject rather than to his students, has little chance to achieve the aims of cultural courses. Nowhere else in the teaching field is a broad training in psychology, sociology, and education so much needed as by teachers of cultural courses, whether in elementary school, high school, or college. (3) For vocational courses, the teacher's first requirement is a thorough knowledge of the field of the given vocation. Since students have a definite motive actuating their study, the teacher's chief function is to lay out for them the materials needed and assist them in the most economical method of assimilating those materials.

In the third place, the schemes of evaluating results of students' work in the three types of courses should be different. (1) In the preparatory courses the test is, "Can he use it in the further study for which it is a tool?" (2) In the cultural courses the test is, "Is he living according to it?" (3) In the vocational courses the tests are, "Does he know it?" and "Can he apply it to vocational situations?"

In the fourth place, the bases for selecting materials for the three types of courses should be different. (1) In preparatory

courses the selection of materials and the amount in each case is determined by the question, "What will the student use?" (2) In cultural courses the selection of materials is determined by the question, "What will lend itself best to the teacher's purpose of securing thinking, resulting in a social viewpoint, a broad perspective, the exercise of initiative and wholesome self-assertiveness, effective study habits, and high resolves prompting the submergence of self in the social good." (3) In vocational courses, the selection of materials will be determined by the question, "What does the vocation call for?"

The above differences in the methods of teaching, the training of teachers, measuring the results, and selecting the materials for courses are rather fundamental. The writer recognizes that there will not be universal acceptance of the validity of the differences claimed. He believes, however, that the discontent regarding the outcome of their work, so prevalent among college teachers themselves, would be more effectively allayed by their recognition of those differences than by any other change in the college. The threefold aim is generally accepted, the differences in practice demanded thereby have been quite disregarded.

There are still other implications in these aims. For example, the study of a language, native or foreign, as a tool, must be carefully distinguished in function from a study of literature by means of that tool. The latter is, of course, either cultural or vocational in aim.

Again, specialization or concentration may be for either cultural ends or vocational ends. Probably it will be found, as pointed out by Professor L. V. Koos,[1] in his forthcoming volume of college studies, that in the minds of the great majority of students, the vocational aim is dominant in the specialization study, particularly in a college within a university. At any rate, where the aim is cultural, teachers, methods, and materials for the specialization studies should be chosen in the light of the implications set forth above for cultural courses. If the aim is vocational, teachers, methods, and materials should be chosen

[1] *The Junior College*, Minneapolis, University of Minnesota (The Graduate School Series). On the press.

primarily in the light of the implications set forth for vocational courses. Colleges having no vocational aim may well have the elementary and advanced work of any given department handled by a common departmental staff, both general courses and specilization courses. Colleges, admitting a vocational aim for their fields of concentration, will logically require fairly distinct separation in teachers and methods between the cultural courses and the specialization courses.

Finally, the so-called extra-curricular activities, largely under student initiative and control, are an important factor in accomplishing the cultural purposes of the college.

College Practices Checked Against These Implications

How do our practices in college square with these deductions which follow logically from the accepted purposes? Let us answer in respect to five important aspects of the college of arts and sciences:

1. *The general organization of the college.*—According to the above deductions there should be unity of purpose, materials and methods in the work of the senior high school and the cultural work of the college. Requirements for graduation from college, then, should be stated in terms of the work of the high school and college combined. This holds with reference to the specific courses required, the breadth of information, and specialization. In practice, however, there is a wide gap between the high school and the college, and but few of these evidences of the unity of the work for ages fifteen to twenty appear.

Logically there should be a rather abrupt change in organization of materials and in method, when the specialization work is begun in the upper division of the college. In practice, the change in purpose is obscured, and no appreciable change in method occurs. The junior college as an upward extension of the high school might well be the end point of general, liberal, or cultural training in the state's system of schools, and should then be marked by graduation with the appropriate diploma.

In the senior college, within state universities at any rate, the vocational viewpoint should prevail much more effectively than now. This should not prevent any student's pursuing any cultural study as far as he cares to, in the same spirit which now actuates our graduate students. The so-called sequences—a given number of credits in courses in a given department—as a requirement for graduation, however, do not satisfy the main purpose of the senior college. Just as a curriculum in electrical engineering calls for mathematics, chemistry, physics, and the like, so a curriculum in entomology must call for specific courses in departments outside of entomology. A sequence of courses in a department does not constitute a vocational curriculum. The senior arts and sciences colleges will come to be more and more a group of curricula, much as an engineering college is a group of curricula.

2. *The type and amount of specifically required work which students must offer for graduation.*—You will recall that the criterion for determining the extent of the study of a preparatory or tool subject is "What will the student use in further cultural and vocational study?" Then how about high school or college mathematics? No other subject except English is as universally required for college entrance as at least two units, frequently three, of algebra and geometry. The number who need these subjects as tools is probably much less than twenty percent of the students who study them. Why are they required? Two reasons are given by college people: (1) it is impossible to say who will need them, therefore all must take them; and (2) it is not admitted that they are tools, but it is insisted instead that there is a training in logical thinking and in exactness in the study of mathematics.

To the first claim my answer is that we can no longer afford that practice. There is some evidence too, that a student ready to enter engineering study, can master the necessary algebra and geometry in a small fraction of the time he now spends upon them in the ninth and tenth grades of the high school. Space will not allow me to cite such refutation as there is of the second claim, but I know of no valid evidence in support of it.

As a second illustration, let us raise the question of foreign languages. Probably more than ninety percent of colleges still require some foreign language in either high school of college. On what argument? Not that students will use the language as a tool in reading the literature of that language. Few language teachers claim that. They claim instead that one cannot understand English grammar except in terms of a foreign language, or that it gives a finer discrimination in the choice of English words, or that it—like mathematics—trains the mind in methods of study or exactness of definition and the like.

The meager work already done in an effort to prove or disprove those claims is admittedly inconclusive. The burden of proof rests with those who make the claims, and the case is far from proved. My own opinion is that we shall soon abandon our present position and classify the learning of a foreign language with the learning of English, and subject its materials and its methods to the rigorous tests of utility as a tool needed for further cultural or vocational study. Under this test, a semester of a language will not be an acceptable unit. Enough study to enable one to read or speak the language effectively will be the minimum.

As further evidence bearing upon the value of mathematics and foreign languages as cultural subjects, I wish to cite the results of a questionnaire answered last spring by 372 seniors in eleven colleges and by 546 graduates eight to twelve years out of college. Among the questions asked were: (1) the major subject studied; (2) the department in which the teacher taught whom they regarded as their "best college teacher"; and (3) their best course (excluding courses having a practical or vocational value).

The results show that while 87 had majored in modern foreign languages, only 22 reported their best teacher in modern foreign languages, and only 15 reported their best course to have been in modern foreign languages. While 40 had majored in mathematics, 39 reported their best teacher in mathematics, and only 14 reported their best course in mathematics.

In contrast with these it is interesting to note that while 41 had majored in philosophy and psychology, 84 found their best teacher and 107 their best course in this department.

In addition to these questions, the alumni were asked "What courses did you take in college which you would not take now if you were just entering college?" Also "What courses would you take in place of the ones you would omit?"

Modern foreign languages would be omitted by 124 and would be taken by 79. Mathematics would be omitted by 89 and would be taken by 26. In contrast, philosophy and psychology would be omitted by 19 and would be taken by 52. These data shed light upon the small cultural value placed upon these subjects I have called tools.

3. *The use of the group system for obtaining breadth.*—Students should know something about a number of fields. Agreed. Therefore, say the colleges, let us group our departments into a limited number of groups, and require that a student pursue some work in each one of a given number of these groups. That is the common practice. If the student chooses, say, the biological science group, he may take botany or zoology or entomology or physiology. These departments are separated from each other by "fair-ground fences" with only occasional knot-holes to peep through from one to the other. The materials making up the beginning course in each department are selected and organized with a view, primarily, to prepare the student for later specialized study in that field. The elementary courses are not designed to be ends in themselves; they are not satisfying from the cultural point of view to the student who does not intend to study more of biological science. What the student needs for "breadth" is a view of the whole field of biological science, presented on the level of an eighteen-year-old, with a view of giving a background for the understanding of those real life problems which rest upon a biological foundation. If breadth is a proper outcome of college study, then breadth should be secured by courses designed for that purpose. Beginnings of highly differentiated departmental specialties are not appropriate substitutes. If the idea is sound underlying the courses lately

introduced in many colleges such as Columbia's Foundations of Civilization, then we shall soon have well-organized courses in the biological sciences, the physical sciences, the fine arts, philosophy, and the social sciences to replace our present group requirements.

Alumni were asked whether they favored having a few basic courses, such as Foundations of Civilization required of all students, and 377 answered "Yes," while 78 answered "No."

4. *The lecture method of teaching.*—The practically universal testimony of students and alumni bears out the statement that the lecture method of instruction is satisfactory only where either inspiration or information is the desired outcome. Where other intellectual or spiritual values are sought, they call for thinking and participation by students. Neither of these activities accompanies listening to most college lectures. The social sciences and history, for example, are particularly rich in possibilities for cultural outcomes if taught from the point of view of developing a social viewpoint, perspective, initiative, intellectual stamina, and self-mastery. In practice, however, elementary courses in these subjects are most frequently taught by the lecture method—a method which defeats most of these aims.

To the request, "Give any suggestion you care to concerning methods of teaching used by college teachers," 583 replies were received from seniors and alumni. Of these, 54 are specific adverse criticisms of the lecture method or the extent of its use, 41 complain of too little participation by students, 109 believe teachers emphasize facts or memory rather than thinking, reasoning, and initiative; and 63 charge that teachers are interested in subjects rather than in students. These four categories comprise more than 47 percent of all the suggestions offered. From this it would seem we cannot obtain the choicest values from cultural courses by a teaching method which does not allow for a rich interchange between student and teacher.

5. *The method of selecting and promoting teachers.*—Practically the only sources from which to select college teachers are the graduate schools. The dominant idea in these schools is information, with some emphasis upon methods of research.

Even though the great majority of the students in these schools enter college teaching as a profession, to date almost no attention is given in them to the pedagogy of college teaching. All over the country we have the curious anomaly of laws requiring elementary and high-school teachers to have pursued certain courses in psychology, sociology, and pedagogy, and yet the college teachers under whom they study are not required to be similarly trained. That there is a methodology of college teaching is not admitted by many of them.

To make the matter still worse, college and university officials commonly allow those teachers with a natural gift for teaching to go unrewarded,—those teachers who are consciously teaching young men and women rather than teaching mere subjects—while those members of the staff who excel in research are rewarded. This is due largely to a failure to separate the teachers of the elementary, general cultural courses from the teachers of the advanced, specialized, and largely vocational courses. For the former, highly trained specialists—especially research enthusiasts—are likely to be ineffective, but trained teachers are needed instead. For the latter a high degree of specialization is essential.

Other evidences could be cited to show discrepancies between accepted theory and present practice, but the foregoing will suffice to illustrate the general statement I wish to make in closing. There is practical agreement as to what the job of the teacher of liberal arts and sciences is. An insufficient amount of profound thinking has been done, however, as to the meaning of this job in terms of the practices of the high school and college. We have, in general, accepted the traditional view that if a boy goes along doing what he is told, and learning what he is taught, he will become a cultured man. We have rarely challenged ourselves with the problem of producing those subtle changes in personality which distinguish a man of culture, of influence, and of integrity, from a man of mere learning. If the difference is brought to our attention, we are prone to say that nature, not education, is responsible for it. Not until now,

when the world is faltering in its advance for lack of adequate leadership, have the high schools and colleges been aroused to the full meaning of their responsibility. They are now coming eagerly to seek for ways to achieve genuine transformation of the characters of the young men and women within their classrooms. Accordingly, we are now witnessing the beginning of fundamental changes in college practices in respect to their curricular organization, in respect to the materials of their courses, and in respect to their dominant methods of teaching.

CHILD ACCOUNTING: III—NEEDS

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The first article of this series on child accounting was a review of present conditions; the second developed the historical background; and in the third an attempt will be made to show the immediate needs.

In the development of a more scientific technique in accounting for the child of school age, the several functions of the social groups interested must be recognized. These are represented by: (1) the child, (2) the teacher, (3) the superintendent and school board, and (4) the state. While the function of all four is directly related to the improvement of instruction, the phases of the problem with which these groups are immediately concerned are different. Any attempt in the way of ultimate organization of the problem must, if it is to be successful, recognize and provide for these diverse needs.

On the other hand, the organization of child accounting must be considered from the standpoint of types. In this respect the ultimate need for child records will fall into three divisions: (1) records of pre-school children, (2) records of children during their school life, and (3) records of children after they have left school.

At present the immediate necessity is to develop thoroughly and satisfactorily the second group, school records. Until this technique has been satisfactorily and completely worked out, it will be impossible to organize pre-school records. The recognition of the need for vocational guidance, direction, and placement will ultimately demand the organization of post-school records. For the next few years, however, child-accounting procedure will confine itself rather closely to the second phase. Nevertheless, the general problem must be recognized in order that research may be organized in the other two complementary fields.

The need for records in the interest of the child demands that accurate accounts be kept of every phase of his educational activ-

ity in order that instruction may be better adjusted to his individual requirements. Such necessary records may be regarded as a form of insurance for the individual.

The first record requirement is accuracy; the second, continuity; and the third, adequacy. The need for accuracy can be met through carefully devised and uniform methods. Continuity can be secured by the adoption of a definite policy and by making mechanical provision for it through the use of proper forms. Adequacy of child records means the careful compilation of (1) personal history, (2) social background, (3) academic achievement on the basis of standardized and intelligence tests, (4) the primary emotional characteristics, (5) vocational tendencies and opportunities, and (6) health data. All of these can be gathered continuously and kept for permanent record on a single form or report that follows the child throughout his school life.

Another type of record is that of attendance. Careful and continuous accounting for the child on this basis is required in order that he may take full advantage of the opportunities offered him by the state.

The kind of information needed for the protection of the child is likewise the kind that the teacher requires to make her contacts with the child more effective. In addition to these permanent records, the teacher also needs certain fuller temporary records that provide her with written notes on the topics mentioned in the previous paragraph.

The superintendent and the school board need more general records. All such records lend themselves to the appraisal of conditions within the schools and indicate their degree of success. The school census sets the first problem of compulsory attendance by indicating definitely the children who should be in school. The analysis of accurate attendance reports will then show the degree to which the compulsory attendance program is being made effective.

The school board, upon the recommendation of the superintendent, adopts a curriculum and sets up standards of achieve-

ment. The appraisal records, prepared from the permanent forms necessary for child and teacher, will serve to indicate the degree of success such a program is having. Such appraisal records should include: (1) promotions and failures, (2) age-grade data, (3) age-grade-progress reports, and (4) individual achievement records upon the basis of standard tests. From these, together with complementary records of teacher training and teacher efficiency, a general statement of conditions may be developed. Such a statement will tell the story of school facts and progress better than any series of personal and verbal contacts.

The state's requirements for child-accounting records are of three types: (1) the actual accounting for children of school age to see that they are really receiving constant instruction, (2) the appraisal of the several types of schools within the state, and (3) material for reference (archival).

The state's needs can be satisfied through the compilation of the same records that come to the superintendent and the school board. The volume will be greater in this case for, instead of receiving reports from a single district, the state will receive them from all the districts. On the other hand, the labors of the superintendent will be lessened considerably if the state records are a duplication of those collected by the district instead of being at considerable variance with them.

Since education is a state function, the development of uniform child accounting demands that the entire organization be developed from the standpoint of the state in order to secure in all districts the necessary continuity, adequacy, and uniformity. Such organization presupposes the authority of the state department of public instruction to insist upon the keeping of adequate child records by the several districts within the state.

In conclusion, the apparent needs are for uniform state-wide systems of child accounting, comprehensive in form and continuous as to type, in order that better knowledge may be developed as to the effectiveness with which the schools are functioning.

Editorials

THE ATTITUDE TOWARD ACCURACY IN MEASUREMENT

It is curious how some people who have been getting along all their lives with only the vaguest notions of where they are "at" educationally—judging the importance of educational facts so inaccurately that their judgments are almost worthless, passing and failing pupils by the use of standards upon which no two people can agree—it is curious how these people as soon as a standardized test is in question immediately demand perfection. The results of the tests must be accurate to a hair or they will have none of them. They point out the discrepancy between two intelligence tests and forthwith decide that the tests are valueless. Yet the discrepancy between two teachers' estimates of a pupil's intelligence is likely to be much greater. Indeed, the difference between two estimates made by the same teacher at different times will almost certainly exceed the difference between the results of two tests.

The demand, however, for greater accuracy of test materials and measurement processes has produced good results. In the beginning we had a few subject-matter tests and that was all we had. We claimed too much for them. Next we began to give intelligence tests and our claims for these were likewise too great. Then we succeeded in uniting the intelligence and subject-matter data into difference and quotient expressions and this gave us corrective information and increased the usefulness of both subject-matter and intelligence tests. Even this, however, did not satisfy the perfectionists. Accordingly, we began to consider the length of time a pupil had been in school and to modify our judgment as to his abilities in accordance with what we called his pedagogical age.

All this time we had been revising the tests themselves. We early found that one form was not sufficient, so we got up duplicate forms running in some instances as high as ten different versions of the same test. We also administered several tests in a given subject to the same pupils, in order to explore more thoroughly their abilities in the subject in question. The "battery" of tests likewise came upon the scene and various and interesting—albeit in most cases intricate—methods of transmutting scores were suggested.

But never, at any time, have we reached the point where the measurements will do all the work. If the perfectionists—be they purists within the ranks of the testers or obstructionists outside of them—demand this, they demand too much. Educational measurements will not automatically and unerringly sift children into compartments and for our part we hope they never will. There will never be a time when our measurement processes will be so extensive that good judgment will not play a proper part after the results have been secured. The real task is to reduce the problem to dimensions such that reasonably good judgment can carry it to a solution.

But even if the test measures are fallible, this does not justify us in throwing up our hands in despair or lifting our voices in derision. Are we not better off than before? Is not the probability of being right greater than it has ever been? Why should anyone want to think any less accurately than he has to about anything that can be the subject of thought?

As we become more and more capable of measuring our methods and results, the discrepancies between our measurements assume larger and larger places in our thinking. This does not mean that the discrepancies are really larger, but rather that the measurements have permitted us to detect them. Things which we never thought of before make themselves manifest. One reason why mistakes in the classification of pupils look so big is precisely because objective measurement serves to show up the blunder. Before we had measurements our failures in this respect were ghastly. But we were blind to them. Therefore we thought they did not exist.

Let's be sensible. Let us demand of the measurers that their system shall be better than the one it seeks to supplant. Let us also call them to account when they are over-pretentious. But let us not demand of them a system which shall work with machine-like accuracy; for in so doing we shall not only ask the impossible, but also stand accused of seeking a desideratum of dubious value.

B. R. B.

ALEXANDER JAMES INGLIS

In the death of Alexander James Inglis, professor of education in the Graduate School of Education, Harvard University, American education and Harvard University have sustained a severe loss. The end came suddenly on April 12 after a very brief illness. Professor Inglis had earned national repute as a leader in the field of secondary education. He had been a prominent figure in the movement for the reorganization of secondary education and in the development of the junior high school. His services as a member of the Faculty of the Graduate School of Education were invaluable. His counsel, his teaching, and his productive work as an author and investigator contributed greatly to the building up of the School.

Professor Inglis was born in Middletown, Connecticut, in 1879. He was graduated from Wesleyan University with the degree of A.B. in 1902. As an undergraduate he achieved high distinction both in scholarship and in athletics. For ten years after his graduation from college he taught in secondary schools in Pennsylvania, New York City, and California, gaining an enviable reputation as a teacher of Latin. He received from Columbia University the degrees of A.M. in 1909 and Ph.D. in 1911.

In 1912 he went to Rutgers College as professor of education and director of the summer school and extension courses, and two years later was appointed assistant professor of education at Harvard University. His promotion to professor of education came in 1919. In that same year, he directed a survey of the educational system of Virginia for a committee of the State

legislature. He also made educational surveys in Winchester, Virginia, and Augusta, Maine, and served on survey staffs in the states of Washington, South Dakota, and Indiana. In 1918 he was a member of the organization committee on education and special training, war plans division of the general staff, and in 1920 was appointed educational advisor at army headquarters. He was a leading member of the Commission on the Reorganization of Secondary Education appointed in 1911 by the National Education Association. The most important publication of this Commission, called *The Cardinal Principles of Secondary Education* was largely influenced by Professor Inglis.

His publications include widely used high-school textbooks in Latin, *The Rise of the High School in Massachusetts, Principles of Secondary Education, Virginia Public Schools, Intelligence Quotient Values,* and standard tests in the fields of Latin and English.

Although his period of productive effort was short, Professor Inglis had a record of accomplishment which few men attain in a lifetime. He was a man of exceptional intellectual vigor and courage—a tireless seeker after the truth. He did not hesitate to take the unpopular side on a question if his clear thinking led him in that direction. His keen mind, his unfailing sense of justice, his humor, his warm human sympathy, and his friendliness gained him the universal admiration and affection of his students and colleagues. His untimely death deprives the Graduate School of Education of an eminent educator whose influence in the School and in American education will be felt for many years to come.

Reviews and Abstracts

SWIFT, FLETCHER HARPER. *Studies in Public School Finance: The West—California and Colorado.* Minneapolis, University of Minnesota, 1922. 221 p.

SWIFT, FLETCHER HARPER; GRAVES, RICHARD A., AND TEIGS, ERNEST A. *Studies in Public School Finance: The East—Massachusetts, New York, and New Jersey.* Minneapolis, University of Minnesota, 1923. 240 p.

Unquestionably school finance is the most urgent problem which educators are facing at present. Because of the large increase in school attendance, particularly in the high schools and colleges, where education is most costly; because of our desire to improve everywhere the means of education; and because of the recent decrease in the purchasing power of the dollar, the problem of getting sufficient money to finance the educational program has of recent years been especially acute. The future bears no promise that the needs for school revenues will grow less. On the contrary, the present augurs the necessity of providing vastly increased revenues. This solemn fact must everywhere be faced.

Our school people are cognizant of this problem—though it must be admitted they became so very tardily—this is evinced by the large amount of research which is now being made on the problem. Hundreds of magazine articles, dozens of survey reports, and several books have appeared on the subject of school finance in the last few years. Especially is this true of the last two or three years.

Of our students of school finance none has "stuck to his last" longer, more consistently, and with better results, than has Professor F. H. Swift. His first important study, which was his Doctor's dissertation, if I mistake not, was entitled *A History of Permanent Common School Funds in the United States, 1795-1905.* This, though published in 1911, is still the chief authority on that subject. Since then, many survey reports, several magazine articles, and two books, all on the subject of school finance have come from his pen. His standing is perhaps another proof of the truth of the dictum that one way to eminence "is to spend several years in learning to do something, and then several years in doing it better than anyone else." Certain it is that few, if any, challenge his pre-eminence in this field.

As long ago as 1915, Swift began the preparation of a series of studies on the systems of school support employed in certain states. The most of these studies have appeared, or will appear, in a four volume series which is being published by the University of Minnesota. Volumes I and II of the series are now in circulation, and are designed, as are the two volumes yet to appear, to describe school finance practices in various sections of the Union.

Volume I is on the West, of which section California and Colorado were selected as representative states. For Volume II Massachusetts, New York, and New Jersey were selected as typifying eastern practices. In selecting the states to represent each section, attempt seems to have been made to choose states which typify as many different practices as possible.

California and Colorado, discussed in Volume I, offer illuminating contrasts in policies. California, largely because of her unusually large amount of state aid, designed to equalize educational opportunities, presents one of the most progressive systems of school finance in the Union. Colorado, on the other hand, due largely to her use of the district as the unit of taxation for school support, with but little state aid, designed to equalize educational opportunity, is characterized as having, at many points, a system of support "extremely antiquated and thoroughly unsound."

The contrasts presented by the practices of the three states, Massachusetts, New York, and New Jersey, discussed in Volume II, are equally illuminating. There are wide differences in the amount of state aid given by these states, the sources from which the state revenues are derived, and the basis or bases on which it is apportioned to the local units. Of the three states, Massachusetts is voted to have the best practice because of her fairly large amount of state aid and her attempt to distribute it on a scientific basis of need, ability, and effort. Swift says, "With the exception of California, no state thus far studied by the writer has as much to offer in the way of suggestion as to sound policies in public school finance." Two of Swift's students, Messrs. Graves and Teigs, have written the chapters on New York and New Jersey, respectively.

Both volumes deal primarily with sources of school revenues in the states discussed. The percent of revenue secured from the various units—Federal, State, County, and local—are shown for each state. The thesis is kept constantly before the reader that the state should contribute a larger percent of school support and that such state support as is given should be disbursed on a scientific basis; the amount given should be determined by the needs, ability, and effort of the local community.

Since one of Swift's fundamental theses is that the state as a unit should contribute a larger and larger percent of the school revenues, one wonders why Delaware, which finances her schools wholly through a state fund, was not included in Volume II on eastern practices. Perhaps he thought that on account of her small size it was hardly fair to call her a state.

The volumes are worth-while contributions to the literature of school finance.

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PYLE, W. H. *Laboratory Manual in the Psychology of Learning.* Baltimore, Warwick and York, 1924. p. 161.

Believing that "no amount of book study about human nature can take the place of even a few carefully devised and executed experiments," Pyle

has outlined a course of experimental study of representative types of learning. Complete directions are given for eighteen experiments which include such motor learning as ball tossing, mirror drawing, card sorting, and marble sorting; a second form of motor learning in which a new instrument the "manthanometer" is used; sensori-motor learning represented by the substitution and card-arrangement tests; perceptual learning by the use of the tachistoscope with spot patterns, letters, and objects; memorization, using nonsense syllables, paired materials, poetry, and prose. In addition to the directions for the particular experiments, the book provides explanations of, and practice in, the use of such statistical methods as finding the central tendencies or computing correlations, and the construction and use of graphs, namely curves of learning and profiles. In the last chapter, the results of all experiments for the class are reviewed; profiles and correlations are worked out to provide the basis for a study of the nature of learning ability. At all stages the author provides illustrative quantitative results for analysis in the interests of small classes and for comparison where classes are large.

The Manual does not contain large amounts of application of facts or principles to other functions such as reading, writing, and spelling. Perhaps the author has exercised wisdom in leaving such explanations and generalizations to other texts or to the teacher whose charges may be interested mainly in any one of several fields of application, education, medicine, industry, or general psychology. The Manual resembles the sort widely used in physiology, physics, and other sciences. It possesses the merits of the conciseness, clearness, and developmental unity of a course of exercises which have been obviously long tried and reorganized with care. The reviewer means to offer no criticism of this book in stating his wish that a companion volume be produced in which the "higher mental" types of learning—problem solving, abstracting, acquiring meanings, generalizing—are given more complete and equally careful attention.

ARTHUR I. GATES

Teachers College, Columbia University

HUMPHREYS, HARRY C. *The Factors Operating in the Location of State Normal Schools.* New York, Teachers College, Columbia University, 1923. 152 pp. (Teachers College, Columbia University, Contributions to Education, No. 142.)

This book deals chiefly with the mistakes that have been made in the past in the location of state normal schools. The author's analysis of these mistakes leads him to the formulation of standards for the location of such schools. These standards are then theoretically applied to one state to determine the most advantageous locations for state normal schools.

The fundamental assumption, which runs through the whole book, is that normal-school costs should approach a definite standard which is favorable to the taxpayer. This standard cost is not set forth with any degree of clearness, and therefore, the reader is unable to acclaim his agreement with the author's contention.

The author proves very conclusively the well-known fact that politics, donations, and existing educational institutions have influenced the location of state normal schools. Some schools whose location was determined by any of the foregoing reasons have prospered and others have not. The author's conclusion is that a body of experts from outside the state should be authorized by the legislature to locate or relocate the state normal schools of a given state. This conclusion is interesting because it suggests a new field for the expert and also because it has never been put to the test. The major consideration from which this conclusion is drawn is that we ought not to make any more mistakes and ought to correct those we have made.

The entire treatment, interesting though it is, could easily have been improved by listing the once established but now abandoned state normal schools. Small state normal schools with high per capita costs are likely to be continued so long as they serve a particular region. There are factors other than location that have to do with attendance at state normal schools. These are largely overlooked by the author, resulting in the impression that this particular problem is still "on the knees of the gods."

JOHN A. H. KEITH

State Normal School, Indiana, Pennsylvania

CLARK, M. G. *Progress and Patriotism.* Bloomington, Illinois, Public School Publishing Company, 1923. 397 pp.

The course of study in history and patriotism that Superintendent Clark outlines in this monograph is the outgrowth of twenty years of investigation and experimentation in three separate communities and in three school systems. The course was first published about ten years ago under the title, *Progress.* At that time the section on "Patriotism" was too incomplete for publication. The addition of this important phase of the study supplies a fundamental line of work which was missing in the first edition.

The course in history is divided into six parts in accordance with the three following fundamental principles: (1) The theme of history is the industrial and social development of humanity. (2) To re-live and to re-solve the primitive problems of the race is easily within the understanding and interest, and the powers of analysis of the primary child. (3) The ability to think, to analyze, and to solve problems should always be at the forefront in the teacher's motive. The divisions in accordance with these principles are:

I. The Home and the Farm—primary school
II. Indian and Primitive Aryan Life—senior first and second grades
III. Steps in Progress and Problems—third grade and junior fourth grade
IV. General Background of American History—intermediate school
V. American History—junior high school
VI. Principles of Progress—ninth grade

Paralleling each of the foregoing divisions of the history course except the first, is a like number of divisions of the course in patriotism. In division two the work centers around the flag and George Washington; in three, Abraham Lincoln; in four, the pioneers, knights of loyal service, and Wash-

ington City; in the fifth, "today-doing men," "Freedom Guards," and wider service of communities; and the sixth, leaders in the State and true citizenship.

As the number of pages will suggest, the work is outlined in great detail. In fact, the writer knows of no previous publication that even approximates Mr. Clark's course in this respect. For some, this minute detail might be confusing and even bewildering. After going through the 397 pages with considerable care, one is apt to have the feeling that where so much is attempted, little can be done well. To offset this feeling of bewilderment, however, one should keep in mind the fact when going through the course that, as used in the schools of Sioux City, Iowa, it is the core about which all school activities center. Thought of in this light, the abundance of detail will not overwhelm the reader.

While the course is a model of its kind, it does not conform to the modern conception of curriculum-making in the social studies. Much progress in this field has been made since the first edition of Mr. Clark's course appeared almost a decade ago. While the present edition is an advance over the first, it is not nearly as up to date as the first one was when it appeared. Progress in curriculum-making in the social studies in some quarters at least is ten years in advance of the present edition. If the reader desires to know what is meant by this last statement, he will find an explanation in Bobbitt's recent book entitled, *How to Make a Curriculum*.

R. M. TRYON

University of Chicago

GRIFFITH, COLEMAN R. *General Introduction to Psychology*. New York, Macmillan Company, 1923. 513 pp.

Psychology has grown. It has expanded. It has ramified. It has foraged the fields of other sciences, but ever with a virile, healthy growth, stimulating rather than blighting its sister subjects, contributing to them as well as assimilating from them. Biology, medicine, education, sociology, even physics and chemistry have contributed to and benefited from this healthy development. If the present subject matter of psychology appears confused, if its postulates seem unstable, if its diversification or applied fields suggest a mushroom growth, let us remember that these are signs of a vigorous adolescence, the more obvious because of a somewhat retarded infancy and backward childhood.

The textbooks of psychology in the past decade have made but little headway in outlining the combined fields of psychology. We have texts of academic or scientific psychology, comparative psychology, educational psychology, abnormal psychology, genetic psychology, *et al.*, to the number of a generous baker's dozen or more. It remained for some intrepid author to survey the entire field of the related branches and applications of psychology in a single volume. This has been attempted by Griffith and the degree of his success may be measured according to one's point of view or professional bias. That the book is an outgrowth of a general survey course in psychology at Illinois is one indication of its practicability.

Viewing the volume in its broad aspects, one must be uncharitable indeed not to give generous commendation both to the endeavor and to its successful

fruition. The treatment is certainly not superficial, as the author had feared, and as might have been expected from the ambitious table of contents. The presentation is serious rather than frothy, technical rather than popular, systematic rather than sketchy, concise rather than brief, dignified rather than elementary, expository rather than controversial; in brief, a well-organized "survey" introducing the student to the entire front of psychology rather than familiarizing him with a limited sector.

The subject matter is organized in five major parts and twenty chapters, with a particularly happy grouping of the diverse special branches of psychological investigation. Part one, the foundations of psychology, deals in three chapters with the opposing standpoints and postulates of psychology as the science of mind, the science of behavior, and the study of mind-body capacities. (We give the chapter-titles.) Part two, genetic psychology, treats of the psychology of animals, the mind of the child, and the inheritance of mind. Part three, social psychology, takes up the general problem of social psychology, the monuments of mind (including language, custom, dress, convention), and the psychology of religion. Part four, the psychology of the abnormal, describes unusual mind-body states, deficient and disordered minds, disordered and diseased minds, hypnosis and the subconscious. Part five, psychotechnology, introduces some of the applications of psychology to problems of human relations, namely, differential psychology, psychology and education, psychology and law, psychology and medicine, psychology and commerce, and special technological problems.

The specialized psychologist will find omissions in these chapter-headings. He will also sometimes be disappointed in the incompleteness of treatment, or may object to specific inaccuracies of statement. To him we gently suggest, "Go thou and try likewise." These specialized criticisms lose weight when one considers the nature, purposes, and uses of the volume.

As a textbook this work will meet a real need for instructors who desire to outline the scope of psychology rather than to impart its detailed knowledge. It is well written as to style, well presented as to pedagogical desiderata (witness copious references, author's index, and careful subject index as well as simplicity of diction and organization), and well chosen as to principal subject matter. The standpoints of psychology are well adapted to the various topics and attest the author's breadth of view.

The book is undoubtedly the forerunner of other texts of like nature which may well take advantage of the present author's shortcomings. Indeed such specific criticisms of the present volume as might be made will no doubt be overcome in the revision of this edition. The trail is blazed. That the traveler experiences some mental discomfort in occasional lack of ballast need not close the route to pioneer traffic. Certainly the beginning student and the psychological public in general can now see Zion as from a height instead of from the valleys. Let none fear but that the perspective so gained will create a discriminating desire for special detail and not a complacent satisfaction with the mere outlines.

E. A. Doll

Ohio State University

KNIGHT, F. B., AND RUCH, G. M. *Syllabus for a First Course in Educational Psychology.* Iowa City, The Iowa Supply Company. No date, 52 pp.

No one doubts that the inexperienced student needs help in his first approach to educational psychology. College textbooks are often little more than "books of texts." There must be a huge amount of supplementation and reading between the lines if the content is properly understood. This syllabus represents an effort to work out a definite technique by which the beginning student may "find himself" in the new subject. The work is divided into thirty lessons filled with pointed thought-provoking questions prepared "in the interest of economy of time and effort on the part of instructors" of large classes as an aid to the pupil "in his own organization of the principles of educational psychology" and in his "formation of economical habits of study." The syllabus is unique in the definite instructions which it affords the pupil for the general preparation of the lessons and in offering additional questions for extra credit. This is the first trace of definite provision for individual differences which the reviewer has seen in a textbook or syllabus relating to college work. It is encouraging to find "preaching brought into practice."

It is to be regretted that this syllabus will lose much of its effectiveness unless it is used in connection with Gates *Psychology for Students of Education.* It is to be hoped that the authors will find time to free their syllabus from any one textbook, for to do so will greatly extend its usefulness and at the same time relieve it from the shortcomings of a single textbook. In its present form, however, the syllabus will render a distinct service to both students and teachers of Gates' book.

WORTH J. OSBURN

State Director Educational Measurements, Madison, Wisconsin

TOOPS, HERBERT A. *Tests for Vocational Guidance of Children Thirteen to Sixteen.* New York, Teachers College, Columbia University, 1923. pp. 159. (Teachers College, Columbia University, Contributions to Education, No. 136).

This book is the preliminary report of one of the most promising researches with prognostic vocational ability tests which has yet been undertaken. Under the auspices of the Institute for Educational Research of Teachers College, Doctor Toops and his co-workers have given a series of vocational guidance tests to one thousand boys and one thousand girls, ages thirteen to sixteen, inclusive. The results of the tests will be checked against subsequent school and vocational histories of the children tested over a series of years to determine their prognostic value.

The tests selected were applied with a view to determining fitness to enter one of three main lines of vocational opportunity: vocations requiring ability to deal with ideas and symbols for ideas; those requiring ability to deal with things and mechanisms, and those vocations demanding ability to deal with clerical items and procedures. For testing ability to use ideas the I.E.R. Arithmetic-Re. Test, combination of Thorndike-McCall reading test and the test in arithmetical-problem solving, was employed; for testing ability

to deal with things and mechanisms, the Stenquist Assembly Test was used for boys and the I.E.R. Assembly Test for girls; for testing ability with clerical items and procedures, (1) high level, I.E.R. General Clerical, C-1, and (2) low level, the I.E.R. Test, C-1.

The results to date indicate interesting possibilities. The tests for "ability with ideas" correlate about as highly with school success as the ordinary group tests of general intelligence, but seem to be less open to the possibility of unfair coaching. The boys and girls tests for "ability with things" correlate well with success in shopwork in the schools, but time has not been sufficient to correlate results with actual work on the job. These tests at least seem to get at elements of ability not reached by the "general intelligence" tests. "Ability with clerical items" appears to be more difficult to isolate than either of the other two abilities investigated. Positive correlations were secured but it has not yet been determined to what extent general intelligence accounts for the results.

The investigators have ample facilities for carrying on the research, and are attacking the problem without narrowing preconceptions. Since they intend to "prove all things," holding fast only to that which is found to be good after ample trials under actual working conditions, a positive contribution may be expected.

WILLIAM M. PROCTOR

Stanford University

MELVIN, A. GORDON. *The Professional Training of Teachers for Canadian Public Schools.* Baltimore, Warwick and York, 1923. 212 pp.

In this dissertation Doctor Melvin has essayed an objective determination of the quality of teacher training given by the normal schools of Ontario. To this end he has closely searched the various blue-books on the subject and, in addition, has secured by skillful questionnaires much valuable information both from teachers in training and from their instructors. On the whole Ontario stands up well when compared with the states of the United States. For example, the average salary in Ontario in 1918 was $966; in the United States $635, with the District of Columbia, California, and New York exceeding the figure for Ontario. The cost per attendance week in Ontario Normal Schools is $6.73, an amount exceeded only by that of California, which is $10.58, and that of Massachusetts which is $9.00.

The median age of normal-school teachers in Ontario is 48 years; in Missouri, 38. The median salary of a normal-school teacher in Ontario in 1921-22 was $3,300 and 81 percent obtained over $2,400; in Missouri, in 1915-16, the median was $1,650, and only 1 percent obtained over $2,400. In Ontario 59 percent of the instructors have the Master's or Doctor's degree; in Missouri only 30 percent. The faculties of the normal schools are in every case above Parker and Judd's minimum theoretical standards. The students in Ontario are younger than in Missouri, 59 percent being less than 20 years of age against 35 percent in Missouri. They come from better homes, 24 percent reporting parental incomes of $2,000 or more compared with 11 percent in Missouri.

The practice-school facilities in Ontario are far in excess of the requirements of the formula suggested by the Carnegie Foundation. Over 85 percent of the teaching population of Ontario were normal-school graduates and 93.6 percent have had professional training; only Massachusetts and Rhode Island make a better showing.

The median student teacher in Ontario is "a young unmarried woman of nineteen years born in a rural community of Ontario of Canadian parentage. She has three brothers and sisters, and her father, who is a farmer, earns less than $2,000 a year. Educated in a rural ungraded elementary school and rural graded high school, she passed out of the latter after four years. On account of a peculiar urge, or a natural liking for what she conceives the teacher's work to be, she entered the normal school and studied there for a year at a cost of $525. She has had no experience as a teacher and expects to limit her experience to five years."

According to Coffman the female teacher in the United States is "twenty-four years of age, having entered teaching in the early part of her nineteenth year when she had received but four years of training beyond the elementary schools. Her salary at her present age is $485 a year. She is native born of both parents, both of whom speak the English language. When she entered teaching both of her parents were living and had an annual income of approximately $800 which they were compelled to use to support themselves and their four or five children. The young woman early found the pressure real and heavy. As teaching was regarded as a highly respectable calling and as the transfer from the schoolroom as a student to it as a teacher was but a step, she decided upon teaching."

What then are the defects? Doctor Melvin finds that the Ontario system is too rigid and stereotyped. As contributing to this, the various state manuals and the rigid state examinations are held chiefly responsible.

The dissertation, on the whole, is a very creditable piece of work. But the proofreading, like the proofreading of most of the books of this publisher, has been very carelessly done. The reviewer marked 57 errors and he was not particularly looking out for them.

PETER SANDIFORD

Ontario College of Education

KANDEL, I. L., editor. *Twenty-five Years of American Education.* New York, Macmillan Company, 1924. 457 pp.

No change in American education during the past quarter of a century is more significant than the increase in numbers of those who have professional training. At the beginning of the period there were few books and almost no scientific angles in the field of education. There was, however, a group of men of remarkable ability and energy who had visions of the importance of schools and who devoted themselves to the development of a science of education. These men, many of whom are still living, have had a profound influence. In their classrooms each year increasing numbers of students have been prepared as educational leaders.

Few have had wider influence upon education than has Dr. Paul Monroe. *Twenty-five Years of American Education* was written by seventeen of Dr. Monroe's former students in appreciation of his services which now cover a quarter of a century. The book, however, is true to its title. The dedication and a brief introduction entitled "Paul Monroe, An Appreciation" by Dr. Henry Suzzallo constitutes about the only direct personal reference.

The first chapter, written by Dr. Edward H. Reisner, is entitled "General Historical Background, 1897-1922." The author presents the various conditions that brought "the educational rebirth which the nation has experienced during the past generation." This serves as an effective introduction to the pages that follow.

The various chapters cover most of the important phases of education. Each phase is presented and interpreted by an authority in that subject. The authors have kept attention focussed upon development and progress in education. The absence of exhortation will increase rather than diminish the influence of the book.

Some features of the work will be subject to criticism. Chapter VI for example is entitled "Development of Method." Ten of the thirty-three pages are devoted to "project teaching." Even those who agree in giving the subject this importance might still be unwilling to accept some of the special subject textbooks that are mentioned on page 175 as "based on the project attack." The kindergarten is not specifically treated.

The book bears evidence of the scholarly work of the editor, Dr. I. L. Kandel. There is a unity that is rarely found in a collection of essays by different authors. The work closes with an index that is a model for completeness and arrangement.

M. B. Hillegas

Teachers College, Columbia University

Athearn, Walter S. and Others. *The Religious Education of Protestants in an American Commonwealth.* New York, George H. Doran Company, 1923. 562 pp. (The Indiana Survey of Religious Education. Vol. I.)

This volume is one of five which will report the results of the Indiana survey of Religious education. The purpose, scope, and methods of the survey are set forth in Part I. Part II deals with church buildings. The methods and contents of the survey have been determined by the following objectives:

1. Facts—Such a body of vital, comparable facts as will guide in building national, state, and denominational programs of religious education.

2. Such a body of standardized technique—norms, tests, standards—as will provide a new and better method of measuring and directing the processes of religious education.

3. Standardized methods for guiding local churches and communities in surveying conditions, building programs, testing results, and determining budgets.

In the second chapter of Part I the reader will find a general summary and recommendations based upon the detailed data presented in the succeeding chapters of the volume.

Part II discusses the relation of the church program to its plant. A score card was devised by which certain Indiana churches were scored. The score card takes into consideration such main items as: (1) site, (2) building, (3) service system, (4) church rooms, (5) religious schoolrooms, and (6) community service rooms. The typical Indiana church score about 500 on the basis of 1,000 points. Heating facilities and fire protection have been shamefully neglected. At least fifty percent of the churches are so far below standard that they are unworthy of remodeling.

Part III deals with the organization and administration of religious education in the local churches. The writer takes up the various agencies which operate either directly under the auspices of the church or within the church under its approval. Data are given in profuse detail showing the extent to which these agencies are directly under the control of the parent organization or are more or less independent while functioning under the shelter of the church. The summaries at the end of each chapter bring the main points developed in such great detail into an easily understood form.

Part IV which deals with child accounting in the Sunday School is likewise noted for the detail with which the investigation was made. Tables of entire distributions occur in both parts perhaps to greater extent than is necessary. Here again, however, the summary at the close enables one to come out of the maze of detail with a clear understanding of the situation which was found by the investigators.

The survey group should be commended for the extreme care taken in securing all the available information bearing upon the items under consideration and for the excellent summaries made at the close of the chapters. There is a question in the mind of the reviewer as to whether the immense amount of tabular data giving complete distributions is justified in such a survey report.

Part V deals with the teachers and the supervision of teaching. Facts concerning the teachers of the state are handled in the usual survey manner, and present the age, income, and social condition of the typical Sunday-School teacher together with the influences which were most effective in causing her to join the church and engage in such teaching activity. Education, training, and experience as well as standards and methods are also analyzed.

Part VI deals with supervision and promotion of religious education, and presents clearly the administrative organization, budget, and general statistics.

The volume as a whole presents the largest amount of carefully collected data on Protestant religious education that we have seen anywhere. Information has been secured upon which constructive programs may be outlined and definite forward steps undertaken.

News Items and Communications

This department will contain news items regarding research workers and their activities. It will also serve as a clearing house for more formal communications on similar topics, preferably of not more than five hundred words. These communications will be printed over the signatures of the authors. Address all correspondence concerning this department to Doctor E. J. Ashbaugh, Ohio State University, Columbus, Ohio.

Cleveland, Ohio, has announced the adoption of departmental instruction in the fourth, fifth, and sixth grades, which will become effective next September.

Youngstown, Ohio, has adopted a plan for week-day religious education to be put into effect as soon as money is provided for a director of religious education.

Mrs. Dorsey of Los Angeles and Doctor Burke of Boston have been reelected to their respective city superintendencies this spring. In order to retain Superintendent Stetson at Dayton, Ohio, the Board raised his salary to the ten thousand class.

A survey of every ward in Cincinnati shows that juvenile delinquency is highest where public playgrounds are lacking. Court records show that in one case, covering a period of three years, delinquency was reduced more than 67 percent after the opening of a playground in that neighborhood. Are playgrounds expenditures or investments?

The Oregon History Test by Hedrick and Hoppes is a test of Oregon history only. It consists of two parts, the first being fifty statements to be completed by a word or date; and the second, a series of thirty statements of the best answer type. The test has been prepared in two forms, and is being distributed by the State Department of Public Instruction.

A Course of Study in Reading and Phonics for the Kindergarten and Elementary Grades in Berkeley, California, reached us a short time ago. This monograph of 104 pages contains many definite suggestions and a large amount of helpful material. A reading bibliography for the first six grades and the teachers' bibliography of books and magazines deserve special commendation.

The April 28 issue of the Los Angeles *Educational Research Bulletin* reports the relation of reading ability as measured by the Thorndike-McCall

scale to length of residence in Los Angeles. The figures given indicate that there is no significant difference in the reading accomplishment of those who have been in the city a number of terms when compared with those who have recently come into the system.

Professor Harris M. Benedict of the University of Cincinnati will again conduct a summer bird course from June 23 to July 5. Those taking the course will live in the dormitories of the Ohio Military Institute, which is especially well situated for the study of bird life. The cost of thirty dollars for tuition, board, and room proves the project to be educational rather than financial.

The report of Superintendent H. S. Weet, *The Junior High Schools of Rochester, New York,* is one of the most interesting books on the junior high school that has come to our attention. Little time is spent on the general theory of what junior high schools should do, but the book records in much detail what the Rochester junior high schools are doing. Students of junior high-school movements should secure a copy of this report.

The JOURNAL is glad to extend congratulations to one of its members, Doctor George W. Frasier, upon his election to the presidency of Colorado State Teachers College, at Greeley. Doctor Frasier went to Denver some three years ago in charge of the Bureau of Research; became a member of the State Teachers College faculty in January, 1923; was made dean a few months later; and on April 10 was elevated to the presidency.

All the world is doubtless familiar with the change in school administration of New York City. Doctor Ettinger, who held the position of superintendent for the past six years, was dropped by a six to one vote; and Dr. William J. O'Shea, for six years associate superintendent, was elected to fill the vacancy. This action, which is usually attributed to political influence, has raised again the question all over the country of the advisability of school boards being appointed by mayors or city councils.

Mr. Charles D. Dawson, assistant superintendent of schools, Grand Rapids, continues to send us copies of the excellent material which he distributes to his teachers. A recent measurement of grades III to VI, inclusive, with the Courtis Silent Reading Test revealed a highly satisfactory condition in the Grand Rapids schools; but the special value of the bulletin in which Mr. Dawson reports these results to his teachers is in the paragraphs devoted to the study and treatment of individual cases, to diagnosis, and to remedies.

The *Program of Measurement in Contra Costa County* by Raymond H. Franzen, assistant professor of education in the University of California, and William H. Hanlon, county superintendent of schools, presents both the method and the results of a measurement program covering that county. The results

of the measurement are expressed in terms of evaluation and efficiency. Record forms are given, and the authors plan to continue the work through a series of years.

A survey report of the public school system of Springfield, Massachusetts, by the Division of Field Studies, Institute of Educational Research, Teachers College, Columbia University, contains 173 pages devoted to the organization and administration, the finance, and the curriculum. In characteristic manner Doctor Strayer and his assistants give not only a vivid picture of the situation which exists but close each section with definite, specific, and practical recommendations.

Records of child fatalities in Detroit since 1919 show that the number of fatal accidents in proportion to the total school population and in proportion to the automobile registration has been reduced one-half during these years that safety instruction has been definitely provided. It is slightly discouraging, however, to note that 1922 was below the point and the tendency is upward again. Automobile accidents are far more numerous than any other type of accidents for children of school age, although they are excelled by burns and scalds for children of pre-school age.

Professor A. G. Capps of the University of Missouri is the director of the Missouri School Survey, which is "a made in Missouri" affair by Missourians, for Missourians—a self-survey in the interests of "all the children of all the people." Facts and opinions are being collected concerning the certification of teachers, school support, and county school administration and supervision for the information of the governor, the legislature, the state superintendent of public schools, and all others concerned to the end of making a greater Missouri school system.

A survey of reading in the first grade of Marion, Ohio, was made in February by means of the Pressey Primary Reading Test. This test consists of two parts, a word recognition and a sentence reading. The maximum score on the entire test is 40; the mid-year norm, 17; and the end-of-year norm, 31. In the 18 classes no median score was lower than 35; three made 40; and the city median was 38. Evidently the vocabulary and type of reading measured by this test is acquired at about normal rate by the first-grade children in this city.

Bulletin Number 19 of the University of Illinois, Bureau of Educational Research, is by Dr. C. W. Odell on *The Progress and Elimination of School Children in Illinois*. The data covers about 70,000 children in ninety-two different communities in that state. The progress of the pupils in schools having annual and semi-annual promotions; the progress of the pupils whose school careers have been in one or in several school systems; the effect of departmental work upon progress, and the distribution of children at each age are among the more significant points brought out in the report.

Dean Hawkes of Columbia states that as a direct result of the use of admittance examinations, which include psychology tests, the percent of students at Columbia forced out because of poor scholarship has been reduced by half. The psychology test used, the Thorndike Admittance Examination, has raised the reliability of college marks in the various departments; and in the general opinion of the better students is a much more just and satisfactory examination than the traditional type. As evidence of their predictive value, sixty percent of those making Phi Beta Kappa were among the highest ten percent on the test four years before.

Bulletin Number 64 of the University of Michigan, Bureau of Educational Reference and Research, is a report of Latin investigation in various high schools of Michigan. The report gives a detailed listing of the results on the various tests in the different schools with a final summary, the essential of which, is, that a year of instruction in Latin has a positive influence on the acquisition of Latin derivatives. While this substantiates the often repeated claim that the teaching of Latin aids in the acquirement of English vocabulary, it does not touch the question of whether the Latin road to English vocabulary is the most economical one to follow. That question was not any phase of the investigation reported in the bulletin.

West High School, Akron, Ohio, has a project to teach educational thrift which has been worked out in a rather satisfactory manner. Recognizing that the project could not be handled in the same way and with the same incentive with the high-school pupils as with the elementary grades, the school was organized into three types of clubs: Vacation, Graduation, and College. A regularly organized campaign was conducted to secure as large a proportion of the high-school population enrolled in one of these groups as possible, and inter-departmental interest was induced. About seventy-five percent of the student population have become depositors, and more than fifty percent have deposited each week.

Those who are interested in the all-year schools will be concerned at the recommendation by Superintendent David C. Corson of Newark, New Jersey, for the discontinuance of the all-year schools which have been operated for some time in that city. If this recommendation is accepted, as it seems likely to be, eight elementary schools, one junior high school, and one senior high school, now on the all-year plan, will be put on ten-months schedules beginning September 1, 1924. "There is no adequate basis for all-year schools other than for Americanization." This, however, does not mean that Superintendent Corson wishes to withdraw school opportunities from pupils in the summer-time. The summer schools as conducted at Newark and elsewhere are a different form of organization from the all-year schools.

In the April issue a notice was made of the course of study issued by the superintendent and teachers of the schools of St. Cloud, Minnesota. We have recently received a second volume devoted to fine and industrial arts. Here,

again, we find combined in an exceedingly helpful way specific objectives, general directions, and illustrative material. A very large amount of specific material has been arranged for each grade which will assist any teacher to prepare her work in an effective manner without at all interfering with her display of fine, constructive initiative. The volume can be purchased from the Board of Education. The congratulations of the JOURNAL are extended to Miss Spencer, the art supervisor, and her co-workers who have produced this valuable addition to the course of study materials now available.

The field of child accounting which tended for some time to be overwhelmed by the general measurement movement is showing evidence of a return to attention by the numerous articles and bulletins that have been appearing recently. A combination of the two movements is evidenced in *A Study of the Over-age Child in School Districts 17 and 18 of New York City* made by District Superintendent William O'Flaherty and a committee of principals. The study received its inspiration from Superintendent Ettinger's annual address of September, 1922, on "Facing the Facts." Intelligence tests and achievement tests in reading, language, and fundamentals comprise the testing program. Results of the tests were interpreted in terms of the over-age status; and administrative and curricular readjustments have been made or are under way.

In our February, 1923, issue commenting on the correlation chart which Dr. Otis had lately issued, we expressed the view that the chart was not suitable for classroom use because it obscures the meaning of the fundamental formula and that it would not be useful in the office unless one had many correlation coefficients to compute. An opinion on the other side is given by Dr. Gustave A. Feingold of Hartford, Connecticut, after actually using the chart:

> I found the chart rather complicated while I was working out my first two or three correlations. But after that it became so simple that now I am able to hand the data and a chart over to any intelligent high-school senior who, after receiving a little explanation and working out one or two correlations, can proceed with the necessary steps without any further attention from me. The chart is a great time and money saver.

"The test of the pudding is the eating." We yield to the evidence.

The British Association for the Advancement of Science will hold its ninety-second annual meeting in Toronto, Canada, August 6 to 13. More than four hundred scientists from Great Britain have signified their intention to attend, and a most cordial invitation is being extended to scientists in both Canada and the United States. The Association is one of the oldest scientific associations of its kind in the world and the meeting affords an especial opportunity for intercourse between British, Canadian, American, and European workers in science. A preliminary programme will be forwarded upon application to the local secretary of the British Association, Medical Building, University of Toronto, Canada. No technical qualifications are required for membership, the payment of five dollars entitles one to attend all meetings for the current year, and the payment of seven dollars and a half gives the previous

privilege plus the printed report. The Association is organized in thirteen sections as follows: Mathematics and Physics, Chemistry, Geology, Zoology, Geography, Economics, Engineering, Anthropology, Physiology, Psychology, Botany, Education, and Agriculture.

The New Trier Township High School at Kenilworth, Illinois, has the distinction of being one of the few, if not the only, secondary school not associated with a city system which has a director of educational research. For this reason we asked Mr. F. E. Clerk, the superintendent, for a statement of the research program. The following was contributed by W. L. Brown, the director of the department:

The Department of Reference and Research has three main functions:

I. To discover and develop the most efficient school procedures through a study of public school methods and an analysis of school statistics. Some of the important fields of study to be investigated in the exercise of this function are:
   1. Instruction costs
   2. The teaching load
   3. The use of the building
   4. The development of school standards and forms
   5. Program making
   6. Statistical studies of school results
   7. Failure
   8. Elimination
   9. Retardation
   10. The social characteristics of the school population
   11. The preparation, qualifications, and efficiency of the teaching force
   12. The marking system
   13. Classification of pupils
   14. Homogeneous grouping
   15. Procedures in child accounting

II. To study and provide for individual differences among the pupils by means of tests and measurements. Under this head the following activities are included:
   1. Giving achievement tests
   2. Developing a testing program and directing the use of the results
   3. Conducting a mental survey by means of group tests
   4. Establishing the level of ability of the various instructional classes in order to facilitate intelligent supervision
   5. Studying particular individual pupils by means of the Stanford-Binet Individual Psychological Examination and by interpretation of all other data available in the records and teachers' reports
   6. The dissemination of knowledge of test technique
   7. The interpretation of test results

III. To assist the department heads and the principal in the supervision of instruction. This function includes:
   1. The studying of classroom methods
   2. The development of standards of classroom methods of: questioning, lesson assignment, lesson motivation, class interest, pupil effort, tests and examinations, discipline, student responsibility, pupil participation, subject mastery
   3. The study and construction of forms for teacher rating and for teacher self-rating
   4. The recommendation of professional reading and the development of a professional library

5. The development of interest among the members of the faculty in scientific education.
6. The testing of teaching through tests
7. The assisting of the principal and the department heads in adapting the course of study to the needs of the community

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Chapman and Cook in their recent article on "The Principle of the Single Variable in a Speed of Reading Cross-out Test" are vigorous in their criticism of Mrs. Burgess' technique. Some of their criticisms challenge one's attention, but none of them are supported by data except what was reported by Gates[1] over two years ago. Gates himself shows that the Burgess and Monroe tests correlate more highly than any other with a composite of reading scales. Chapman and Cook give no data to show how their test correlates with other scales or a composite thereof.

If they believe that all previous scales have been on the wrong track, and that therefore good correlation with them would be an indication of weakness on the part of a scale, should they not show that their scale has a low correlation with others? Have they worked out any correlation tables? If so, why do they not publish them?

The critical analysis to which they subject Mrs. Burgess tempts one to turn the same spotlight on their own procedure. Such questions as the following naturally occur to the reader of their interesting article:

Since the recognition of absurdity is a part of the Stanford-Binet test, is it not possible that the Chapman-Cook test correlates more closely with intelligence than with reading, as the Thorndike-McCall test perhaps does? Anyway, what is the correlation between this test and intelligence?

In giving the original form of the test "about one hundred paragraphs" were tried out. The number of correct responses was secured from 200 sixth-grade children and 150 fifth-graders. But the *time*—which is an essential of the test—was measured for only 26 sixth-grade children and 23 seventh-grade children. Were these 26 and 23 children part of the 200 and 150? If so, why select only a small part? If different, why measure comprehension with one group of children and speed with a different group? Incidentally, why not tell the readers of the article what was done? Do the writers consider 26 children a large enough number to determine uniformity of time units?

Another question arises in this same connection: Out of "about one hundred paragraphs," thirty were found to be marked correctly by "approximately the same percent of pupils as were the other paragraphs; and in approximately the same time." If given to another group, would the same thirty have stood out? Have the authors measured the validity or reliability of the test? If they have not, do they consider such measures immaterial for a standard test that is being commercially published? If they have data on validity, why keep their readers in the dark concerning them?

Was any reader of the article sufficiently clever to decipher Table II? What do the numbers in the various columns mean? They were "worked out

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[1] Gates, A. I. "Reading and Reading Tests." *Journal of Educational Psychology*, 12:387, October, 1921, and subsequent numbers.

as a result of measuring approximately 1,000 children." (The authors like "approximate" round numbers.) But how were they worked out? How many children to the grade for which "norms" are given? What is the meaning of such terms as *Highest, Very High, High, Medium High?* Mrs. Burgess at least gives us a distribution table and uses terms with quantitative meanings.

Possibly the authors of this test have given it a much more rigorous treatment than their article indicates. If they have, won't they publish their results? For the test is an interesting one, and many of the author's claims for it appear on their face to be justifiable.

CARLETON W. WASHBURNE

Professional Training Through Practical Problems

Not long ago there appeared from the press of the Public School Publishing Company of Bloomington, Illinois, a collection of "Problems in Educational Psychology," by Doctor Whipple. The idea impressed us at the time as being exceedingly important. In the case of each problem, it consisted essentially of setting up a condition—usually an extremely practical one—after which the student was required to formulate certain answers with reference to the situation. At the same time he was given several readings to assist him in handling the problem.

In rapid succession additional problem materials have been issued by the same publishers and under the editorship of Doctor Whipple. Six numbers of the series have now appeared. In addition to the first number mentioned above the following have been published: *Problems in Secondary Education* by J. B. Edmonson; *Problems in Elementary-School Instruction* by Clifford Woody; *Problems in the Administration of a School System* by J. B. Edmonson and Erwin E. Lewis; *Problems of the High-School Teacher* by J. B. Edmonson and Raleigh Schorling; and *Problems of the Rural Teacher* by Marvin S. Pittman.

The skill with which the authors and the editor have united the two ideas of practical value and thought stimulation appeals to us. Instructors in universities, colleges, and normal schools will find these books of problems of high value in conducting their classes. Quite at random, we take the book on problems of administration to sustain the point we have just made. After introductions by the editor and by the authors, including suggestions to the student for handling the problems, eighty-four specific situations are set up. They are grouped under the following headings: The Powers and Duties of the Board of Education; The Powers and Duties of the Superintendent; Problems Pertaining to the Teacher; Problems Pertaining to the Pupil; Problems of Finance, Salaries, and Pensions; School-Building Problems; Library and Textbook Problems; Problems of the Course of Study and Program Making; and School-Home-Community Problems.

The manner of presenting these problems is interesting. For example: "Why five superintendents were dismissed," "What data are needed in selecting a new superintendent," "The new superintendent undertakes to clean

up the town," "Rating the administrator," "Superintendent L encounters a 'bluffer'," "Superintendent T promotes an inefficient teacher," "Superintendent X compromises in a difficult situation," "The teacher's contract," "Lazy John's mother wants him to graduate from grammar school," "An experiment in classifying pupils," "Superintendent Z supports his teachers," "Superintendent H handles the hoodlums," "A salary schedule in a city of ten thousand," "How to determine the minimal annual salary," "How the board at V proposed to reduce school costs," "The work-study-play plan," "A daily schedule of classes," "The program of a parent-teacher club," "The greatest service a superintendent can render a city." These topics, all of which are treated in problem form, are hastily snatched from the eighty-four contained in one of the issues of this admirable series.

The idea behind all of this is worthy of the editor and of the group of authors who are supporting him in this project. It would be difficult to find a more effective way of presenting the topics to which each of these volumes is devoted than to approach them from the point of view of the problems which actually arise in practice and to apply, as the authors have consistently applied to the problems, the evidence to be derived from specific references. But perhaps more important than the references is the thought which the stimulating character of the problems must inevitably actuate in the students themselves. We know of no more promising approach to the fields covered by these six volumes than the problem approach which is here utilized. And as the later numbers have put in their appearance, we have realized that in this series there is really something new, something significant, and something vital for the use of teachers and students of education.

Rapid and Easy Enrollment

While this article may not bind up the broken-hearted, it is here produced that it may set at liberty the captives. For some five years Omaha Central High School has been using a plan whereby students enroll themselves at mid-year. This plan will be extended to the fall enrollment, September, 1924. On January 28, 1924, twenty-four hundred students enrolled themselves within two or three hours. Nearly all of the actual work was done by the students. Sometime ago it would have been necessary for the three principals to take the entire Christmas vacation, a good many nights, and parts of many days to accomplish this enrollment. The principals are now set free for more important work.

Briefly, our plan is this: Some weeks before the close of the semester, guidance and suggestions are given and each student's course is carefully planned. Tallies then taken make up the basis of the program which is blocked out, submitted to the school for inspection and, finally, taken off in five "make-up sheets." The first section of our present program is here produced to show arrangement:

English VIII

I—119, F. Davies	IV—448, Towne
I—141, Hilliard	IV—119, F. Davies
II—238, H. Clarke	V—228, Stegner
II—228, Stegner	VI—141, Hilliard
III—119, Towne	VII—238, H. Clarke

(Roman numbers above refer to periods and arabic to rooms)

The five sheets thus show the various sections under proper headings, together with hours, room numbers and teachers' names. These are posted in halls for inspection some three or four days before enrollment day. In the enrollment, students are thus given entire choice of teachers, hours, and rooms. To prepare for enrollment each student makes himself a dummy program as his first choice. In anticipation of the fact that he may not get to all of the classes before they are filled, he usually makes himself a second and a third dummy program to fall back upon if necessary.

Enrollment day is divided into two general parts. The first part consists of the seven periods of the old semester in which students get their report cards and are permitted to enroll with the teacher of the previous semester, provided the student wishes to continue with that particular teacher. The student may change the hour if he wishes. When the seven periods are completed, a long bell is sounded as a signal for a free-for-all for everyone. At this signal a student may go to any teacher with whom he wishes to enroll. We now need to go back just a little in our story to show how the plan is safeguarded. Before a program card is handed a student in the early part of the day, the student must fill certain other records, such as attendance card, which the school holds. The teacher keeps a list of all students to whom she gives a blank program card. Her name is also stamped at the top of the card. Every teacher must have in hand several days before the enrollment a rubber stamp bearing her name. Actual enrollment takes place as follows:

The student goes to the teacher's room with whom he wishes to enroll, asks the teacher if he can get into her class and, if the answer is in the affirmative, writes his name on a new class roll designed by the teacher for that particular class. He then fills in his program card with the room number and name of subject in the proper hour space. To make the enrollment official the teacher stamps her name in an extension of this same space. The teacher now has the name of the student on her class roll for a particular hour and the student has the teacher's official approval of his enrollment on the program card which he carries with him. The student then goes to another teacher whom he wishes, secures enrollment in another class in the same way as before. He continues this process until he is enrolled in the four subjects which he is to take. As evidence of his fitness to enter a certain class, he produces his report cards to show the work passed the previous semester. If the student is not able to get into a particular teacher's class that hour in the day, he then falls back to his second choice and even later, to a third choice. Following the enrollment in his four subjects, he goes to the study-hall teachers and enrolls with them. Since our study-hall rooms are distributed to the four floors of the building, the student may try to get a choice in study halls as well as a choice of teachers. The student must have every space on his program filled in order to enter regular class work the next day. To get a further check upon the validity of the enrollment, the teacher checks his name against her class roll when the student enters the class the day after enrollment.

The paramount consideration with the student always is the teacher. He will sacrifice almost anything to get the teacher he wants. In the process of enrollment, a student may find that a second class which he hoped to get is filled and that he can enter that subject only at the hour in which he is enrolled in his first subject. In this case he goes back to the teacher with whom he is first enrolled, tells her he must drop out of her class, gets a new program card and starts again.

In order that classes may not be crowded, we limit the maximum number at first to twenty-two students—our normal number in a class is twenty-five. As soon as a section is filled to twenty-two, this fact is reported by the teacher to the Tabulating Bureau. If all sections in that same division are filled to twenty-two, the head of the Tabulating Bureau sends word to teachers to open classes to twenty-five. If all sections are again filled to twenty-five and it seems there are several students yet to be enrolled, a new section is formed at once and assigned to a teacher who can take the work. If, after the enrollment has reached twenty-five, it is apparent there are only two or three more students to be enrolled, teachers are asked to take one extra in each section.

Incoming freshmen are scheduled by the office in advance of the above enrollment. Tallies are given to teachers that they may not over-fill their classes. About ninety-eight percent of the remaining students in the school are able to complete the enrollment under the above described plan in about two hours. The other two percent have to have some help from the office. The entire enrollment is closed always at one o'clock and a tally taken for the entire school. Later in the afternoon, when this complete tally is secured, students may come to the office to enroll. Of course, we have the usual number of stragglers through the week and these are taken care of at the office. After we once get the tallies at the close of the enrollment day, it is well known just where we have space in classes. If, on the next morning after enrollment, when all classes are to meet regularly, we find one hundred students or one hundred fifty in line trying to get to the office for enrollment, we sometimes send these to the teachers for their enrollment the same as the previous day. This has not always been completely successful since the teachers are busy with classes and the students who could not get themselves enrolled on enrollment day have not greatly developed in their ingenuity and understanding over night.

Since this plan is a free-for-all and since everyone has a chance, at least, to get the teacher he wishes, it does seem to satisfy them and not very many ask for a change of teachers—the bane of any high school—after once in classes. During the five years this plan has been in use, many valuable and important suggestions have been made by different faculty members. The plan has thus been developed into what might be called an "Automatic Safeguarded Self-Enrollment Method." The writer has tried a number of different plans in different high schools and has examined others but would not go back to any of the old cumbersome methods for any consideration. A complete mimeographed, detailed plan of procedure will be mailed to anyone interested in trying out self-enrollment.

JOS. G. MASTERS

Omaha Central High School

Educational Research Association

(HARRY A. GREENE, *Secretary and Editor*)

A relatively large number of changes in the personnel of the Educational Research Association makes it advisable to present a complete list of members in good standing at this time. This list is complete and accurate as far as it is possible for the secretary to make it. Information leading to the correction of errors in names or addresses will be appreciated.

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